2015

Selected Reportable Communicable Disease Summary

Oregon Health Authority

PUBLIC HEALTH DIVISION

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Executive summary

Communicable disease reporting

Oregon law specifies diseases of public health importance must be reported to local health authorities by diagnostic laboratories and health care providers. The 2015 annual report is the aggregation of these data on selected reportable diseases in Oregon with background on the epidemiology of the condition, trends, and descriptive epidemiological data. In some cases, we present case counts by year, aggregate counts by month to demonstrate seasonal trends, incidence by age and sex, incidence in Oregon compared to national incidence and incidence by county. *Salmonella*, *Shigella*, Shiga toxin-producing *E. coli*, *Crytococcus*, *Legionella*, Lyme disease, tularemia, animal rabies and campylobacteriosis case counts increased in 2015. Acute hepatitidies and pertussis counts were down.

That other *Mycobacterium*

Oregon surveillance for extrapulmonary disease caused by nontuberculous mycobacteria (NTM) commenced in January of 2014. Ninety-eight cases of extrapulmonary NTM were reported among Oregon residents in 2014 and 2015. The median case age was 55 (range, 1–92) years, 51 (52%) were female, and 37 (38%) were hospitalized at the time of specimen collection. Tissue and wound cultures accounted for 46 (47%) of the cases. *M. avium* complex (MAC) was the most frequently reported species with 42 cases (43%); 16 of those were from children 1–4 years of age. In Oregon, the highest rates of infection were reported among children <5 years of age.

Three NTM clusters were detected during 2014–2015. An *M. fortuitum* cluster comprised seven cases who had prosthetic joint replacement surgery. A two-case cluster of *M. fortuitum* infections was associated with abdominoplasty in an ambulatory surgery center. Two *M. haemophilum* cases followed art work at a common tattoo parlor.

Legionella lurking

Legionellosis became reportable in Oregon in 2001 and nationally in 2009. Rates of reported illness have increased each year, both in Oregon and nationally. The cause of the rise is unknown; however, increases in older persons and those with underlying diseases, along with increased case detection and reporting may have been playing a role.

In 2015, 50 cases of legionellosis were reported among Oregonians; 96% were hospitalized, and five died. Though no outbreaks occurred on Oregon soil, two large outbreaks occurred in the Bronx, bringing national attention to outdated and ill-maintained plumbing systems. None of the 50 Oregon cases reported travel to New York City during their exposure periods. However, due to multiple outbreaks in hospitals, health care settings, and apartment complexes, a new industry standard for prevention of *Legionella* growth and transmission in water systems in buildings was published in 2015.

Shigellosis swells in the city

Shigellosis is an acute bacterial infection characterized by (sometimes bloody) diarrhea, vomiting, abdominal cramps, and, often, fever. In Oregon, shigellosis is typically caused by *S. sonnei* or *S. flexneri*.

Since June 2015, an outbreak of *Shigella sonnei* infections has struck residents across 19 states. In total, 175 infections have been reported, with 102 occurring in Oregon, making it the largest outbreak of confirmed shigellosis in state history. The overwhelming majority of cases in this multistate outbreak have been among men, particularly among men who have sex with men (MSM). In Oregon, the outbreak spread among MSM and then among homeless persons in Portland.

Non-O157 STECs lead the pack in Oregon

With increasing deployment of diagnostic kits that identify not just *Escherichia coli* O157 but any Shiga toxin-producing *E. coli* (STEC) comes an appreciation of the significant role that other STEC play as human pathogens. In the U.S. (and in Oregon), O26, O45, O103, O111, O121 and O145 have been the most common "other" serogroups — i.e., the non-O157 serogroups that make up about half of reported STEC cases. Over the past 10 years, the number of O157 cases reported statewide has ranged between 57 and 106 annually. After being relatively steady during 2008–2011, the rate began to increase, and reached a peak of 2.7 cases per 100,000 persons in 2013. In 2015, the rate was 2.6 per 100,000.

Reported infections by non-O157 STEC serogroups have increased steadily from single digits in 2007 and 2008 to 109 confirmed cases in 2015. Of the 215

confirmed STECs serotyped in 2015, 106 (49%) were O157, and 109 (51%) were non-O157, including O26 (56), O103 (17), O121 (10) and 18 other serogroups. Fifty-six cases were hospitalized; two died. Eleven cases developed hemolytic uremic syndrome, all but one had STEC O157.

Incidence remains highest (21.5 per 100,000) in children aged <5 years.

Menacing meningococcus

After a decade of decline, meningococcal disease in Oregon reversed trajectory. In 2013, Oregon's rate of 0.3 per 100,000 was the lowest rate recorded and close to the national rate of 0.2 per 100,000. However, since 2013, however, Oregon's case counts have increased, with serogroup B in the lead. A seven-case outbreak of serogroup B disease, including one fatal case, struck the University of Oregon during January–May. All but one case were among students 18–20 years of age. Close contacts of each case received antibiotic prophylaxis in accordance with CDC recommendations. Mass vaccination clinics using a newly licensed 3-dose serogroup B vaccine were held in March 2015, after 4 of the 7 cases had come to light, with follow-up clinics in May and October.

Fungus among us

Infection by *Cryptococcus* became reportable in Oregon on August 19, 2011, though public health officials have tracked voluntarily reported cases since 2004. Seventy-six cases occurred among Oregon residents in 2015. Among culture-confirmed cases the most common infection was *C. neoformans* (18), followed by *C. gatii* (14). Cryptococcal infection is now frequently diagnosed by antigen detection rather than by culture. The antigen is not species-specific; it does not distinguish *C. neoformans* from *C. gattii*.

Forty-nine percent of interviewed cases had no history of travel outside of Oregon in the 13 months before illness onset, and so were apparently acquired in Oregon.

Introduction

About surveillance data

Oregon law specifies diseases of public health importance that must be reported to local public health authorities by diagnostic laboratories and health care professionals. This report reflects reporting laws in effect for 2015. In general, local public health officials investigate reports of a communicable disease to characterize the illness and collect demographic information about the case, to identify possible sources of the infection, and to take steps to prevent further transmission. Basic information about each case is entered into a centralized database. In some cases (e.g., *Salmonella* infection), laboratories are required to forward bacterial isolates to the Oregon State Public Health Laboratory for subtyping. Together, these epidemiologic and laboratory data constitute our communicable disease surveillance system. Data from 2015 and trends from recent years are summarized in this report.

However, reportable disease data have many limitations. First, for most diseases, reported cases represent but a fraction of the true number. The most important reason for this is that many patients — especially those with mild disease — do not present themselves for medical care. Even if they do, the health care professional may not order a test to identify the causative microorganism. The reader may be scandalized to learn that not every reportable disease gets reported as the law requires. Cases are "lost" to surveillance along each step of the path from patient to physician to laboratory to public health department. In the case of salmonellosis, for example, reported cases are estimated to account for approximately 3% of the true number.

Second, cases that do get reported are a skewed sample of the total. More severe illnesses (e.g., meningococcal disease) are more likely to be reported than milder illnesses. Infection with hepatitis A virus is more likely to cause symptoms (and those symptoms are more likely to be severe) in adults than in children. Testing is not random. Clinicians are more likely to test stool from children with bloody diarrhea for *E. coli* O157 than to test stool from adults with bloody diarrhea. Health care professionals may be more inclined to report contagious diseases such as measles — where the public health importance of doing so is obvious — than to report non-contagious diseases such as Lyme disease. Outbreaks of disease or media coverage about a particular disease can greatly increase testing and reporting rates. Despite their

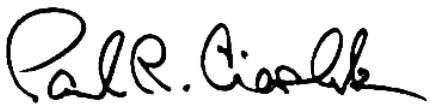
limitations, reportable disease data remain valuable in a variety of ways. They help identify demographic groups at higher risk of illness. They allow analysis of disease trends and identify outbreaks of disease.

Cases are assigned to the county of residence at the time of the report — not to the county in which the case received medical care, or the county where the exposure to infection occurred. Incidence is annualized by onset date unless otherwise indicated. Case counts include both confirmed and presumptive cases. For additional information on case definitions, see the Oregon Investigative Guidelines available online.

Population estimates for crude rate calculations were obtained from the Population Research Center at Portland State University (http://www.pdx.edu/prc). Using rates instead of case counts allows for comparisons between populations of different sizes — e.g., U.S. versus Oregon. Rates are usually reported as cases per 100,000 persons per year. However, if the population in which the rate is calculated is very small (e.g., in Oregon "frontier" counties), a case or two might mean the difference between a rate of zero and a very high rate. To compensate for this, some of our maps and rates by age show an average rate over multiple years of data. Even with multi-year aggregation, for some conditions the case counts remain small.

With all this in mind, we present the 2015 Oregon reportable communicable disease summary. We present 28 years of case counts whenever possible. For most diseases, you will find case counts by year, aggregate case counts by month to demonstrate any seasonal trends, incidence by age and sex, incidence in Oregon compared to national incidence over the past 15 years, and incidence by county. When appropriate, additional data on subtypes or risk factors for infection are included. At the end of this report is a tally of disease outbreaks investigated during 2015, a summary of enhanced data on gastroenteritis outbreaks, a summary table of statewide case counts over the past 20 years, counts of lower-incidence conditions, and disease totals by county.

We hope that you will find these data useful. If you have additional questions, please call our epidemiology staff at 971-673-1111 or email ohd.acdp@state.or.us.



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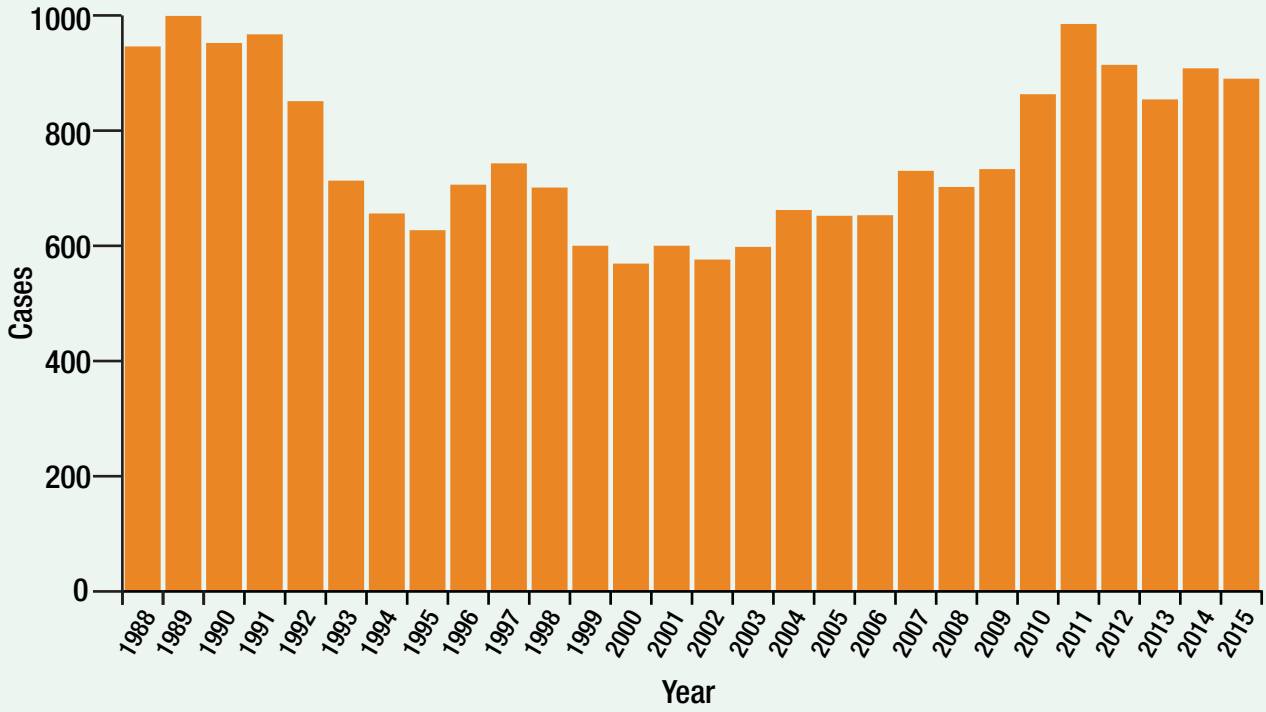
Campylobacteriosis

Campylobacteriosis is caused by the Gram-negative bacterium *Campylobacter.* It is characterized by acute onset of diarrhea, vomiting, abdominal pain, fever and malaise. Symptoms generally occur within 2–5 days of infection. Campylobacteriosis is the most common bacterial enteric infection reported in Oregon. It is of worldwide epidemiologic importance due to the fecal-oral route of infection and the extensive reservoir of the organism in both wild and domestic animals. Many cases are thought to result from eating raw or undercooked meat (in particular, poultry) or through cross-contamination of uncooked or ready-to-eat foods.

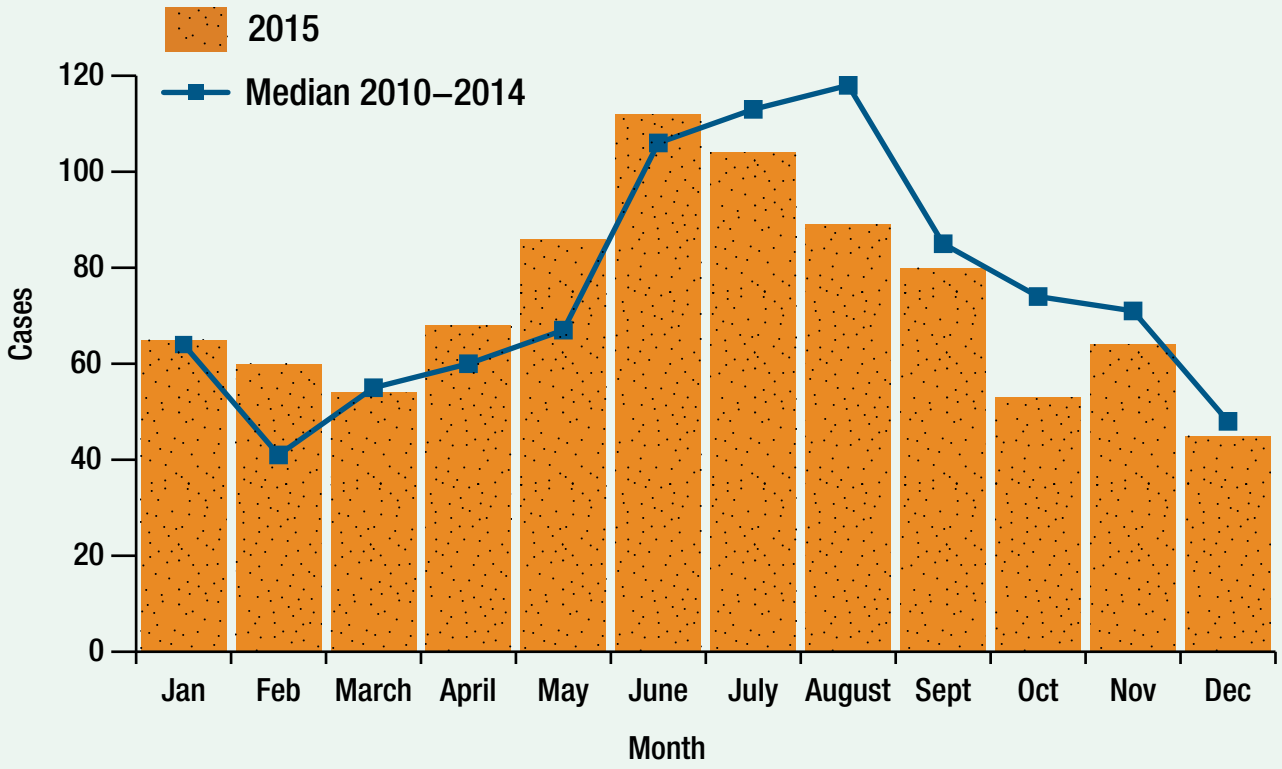
In 2015, 889 cases were reported, slightly lower than in 2014 (907). Children aged 0–4 years have the highest rates of illness (34 per 100,000). Infections occur year-round in Oregon, with peak incidence in the summer months.

Most illnesses are sporadic, but outbreaks may be associated with undercooked meat (often chicken), unpasteurized milk, direct contact with animals or non-chlorinated water. There were no reported outbreaks in Oregon during 2015. From 2010–2015, 10 outbreaks of campylobacteriosis have been investigated: seven foodborne, one from animal contact, one person-to-person and one where mode of transmission was indeterminate. Proper food handling and water treatment, along with good hygienic practices are the keys to prevention.

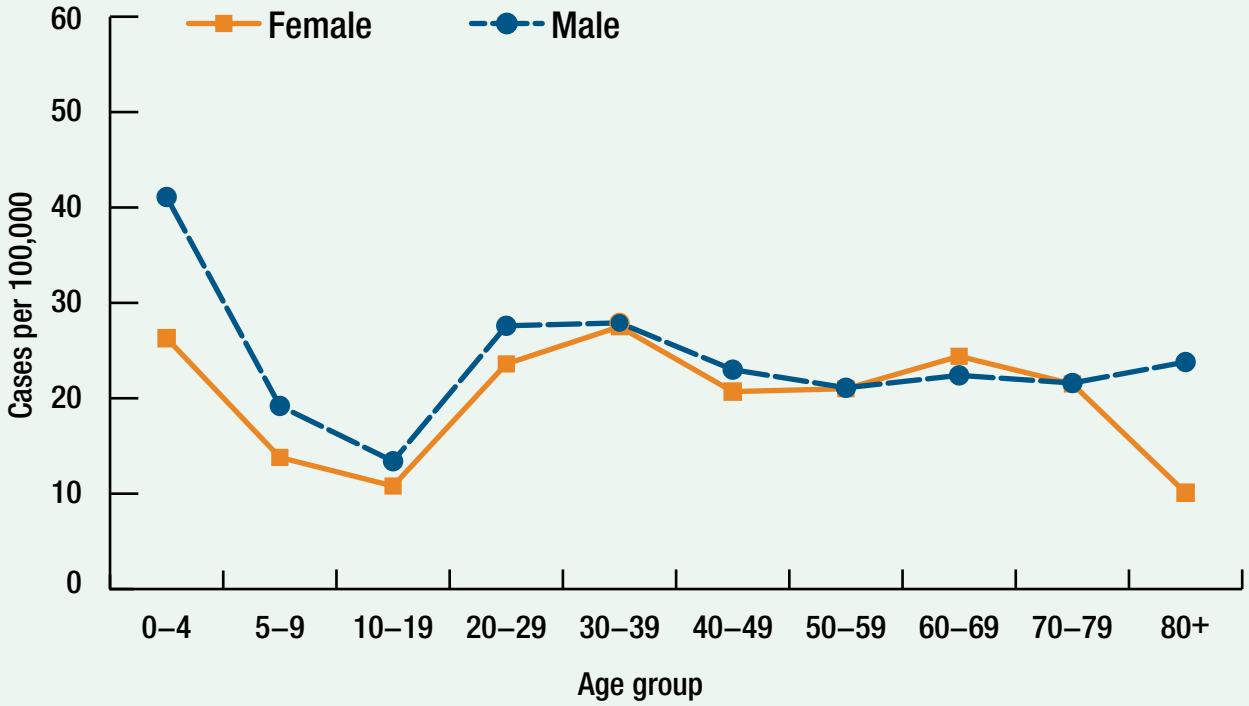
Campylobacteriosis by year: Oregon, 1988–2015



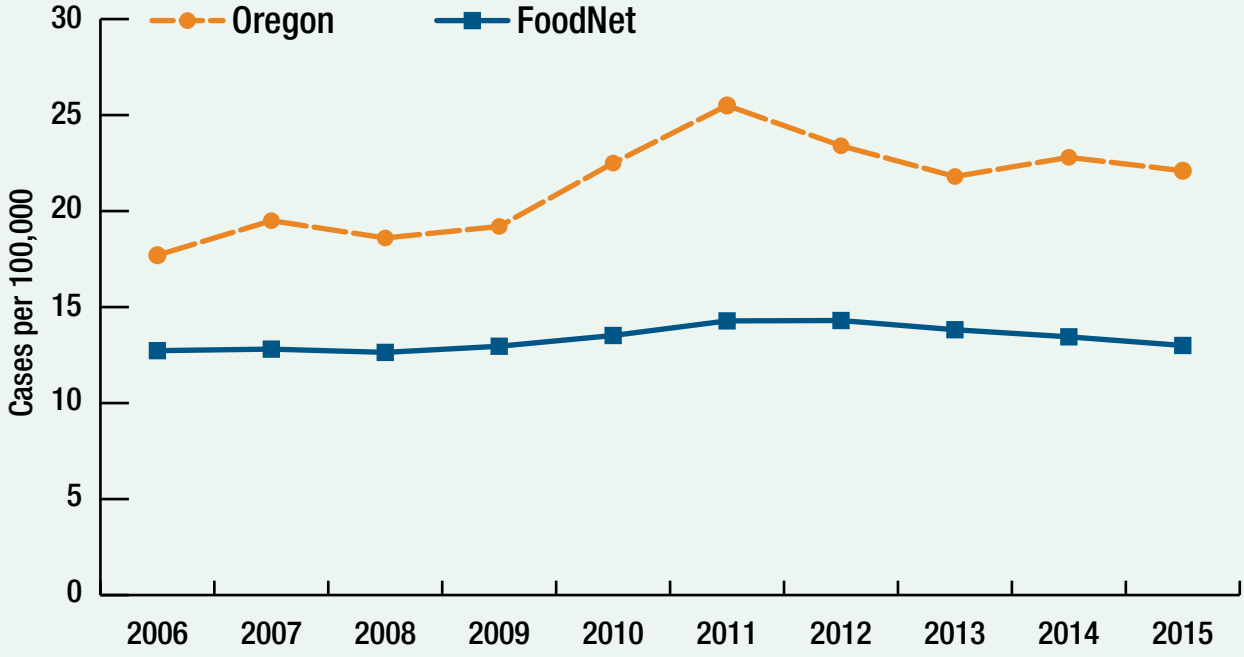
Campylobacteriosis by report month: Oregon, 2015



Incidence of campylobacteriosis by age and sex: 2015

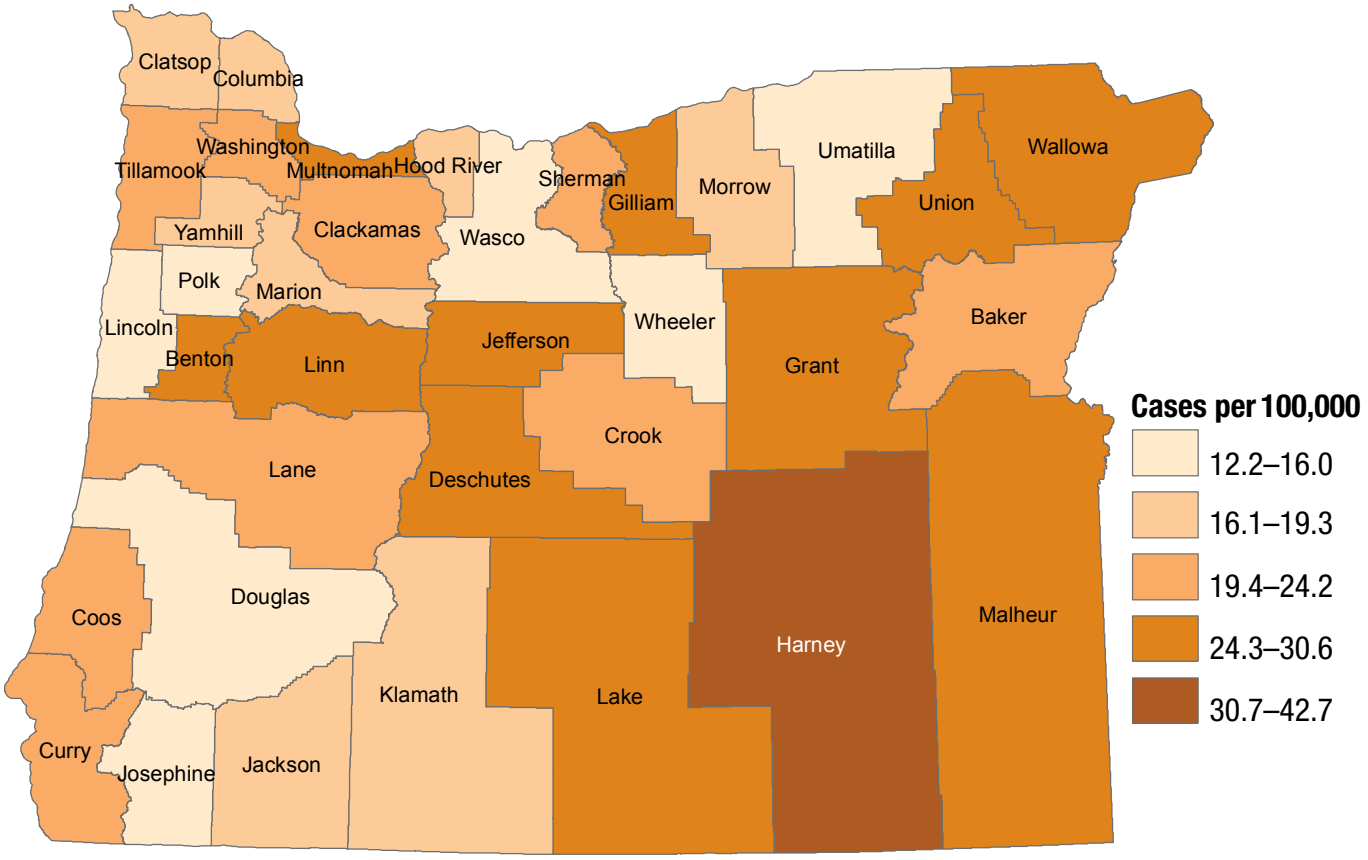


Incidence of campylobacteriosis: Oregon and U.S. (FoodNet sites), 2006–2015



FoodNet	12.7	12.8	12.6	13.0	13.5	14.3	14.3	13.8	13.5	13.00
Oregon	17.7	19.5	18.6	19.2	22.5	25.5	23.4	21.8	22.8	21.4

Incidence of campylobacteriosis by county of residence: Oregon, 2006–2015



Prevention

- Wash hands with soap and hot water before preparing food, after handling foods of animal origin, and after contact with pet feces.
- Thoroughly clean all cutting boards, countertops and utensils with soap and hot water after preparing foods of animal origin.
- Cook all products of animal origin, especially poultry products, thoroughly.
- Do not drink unpasteurized (raw) milk or untreated surface water.
- Make sure persons with diarrhea wash their hands diligently with soap and warm water after using the bathroom.

Carbapenem-resistant *Enterobacteriaceae* (CRE)

The *Enterobacteriaceae* are a large family of Gram-negative bacilli found in the human gastrointestinal tract. Commonly encountered species include *Escherichia coli, Klebsiella* spp., and *Enterobacter* spp. Carbapenem-resistant *Enterobacteriaceae* (CRE) are non-susceptible to carbapenem antibiotics. They are broadly categorized based on the mechanism of their resistance as carbapenemase producers (CP-CRE) and non-carbapenemase producers.

Carbapenems are broad-spectrum antibiotics typically used to treat severe health care-associated infections (HAIs) caused by highly drug resistant bacteria. Currently available carbapenems include imipenem, meropenem, ertapenem and doripenem. Although related to the ß-lactam antibiotics, carbapenems retain antibacterial activity in the presence of most ß-lactamases, including extended-spectrum ß-lactamases (ESBLs) and extended-spectrum cephalosporinases (e.g., AmpC-type ß-lactamases). Loss of susceptibility to carbapenems is a serious problem because few safe treatment alternatives remain against such resistant bacteria.

Infections caused by CRE occur most commonly among people with chronic medical conditions, through use of invasive medical devices such as central venous and urinary catheters, frequent or prolonged stays in health care settings, or extended courses of antibiotics. CP-CRE are most concerning and have spread rapidly across the nation and around the globe, perhaps because carbapenemases can be encoded on plasmids that are easily transferred within and among bacterial species.

In December 2011, CRE bacterial isolates became reportable statewide. The CRE case definition has gone through major changes over the years, which is reflected in the big changes in case numbers from year to year. In 2013, the definition was non-susceptible (intermediate or resistant) to all carbapenems tested and resistant to any 3rd generation cephalosporins tested. This definition was considered to be too non-specific. The definition was then revised in 2014 to non-susceptible to any carbapenem, excluding ertapenem, and resistant to all 3rd generation cephalosproins tested. A study conducted by CDC found this definition to be too insensitive in picking up carbapenemase producers. The current definition is resistant to any carbapenem antibiotic. This definition is simpler and is aligned with CDC's.

The Oregon State Public Health Laboratory offers specialized testing to determine whether reported CRE are carbapenemase producers and the Oregon Public Health Division's HAI program performs detailed investigation of any reported cases.

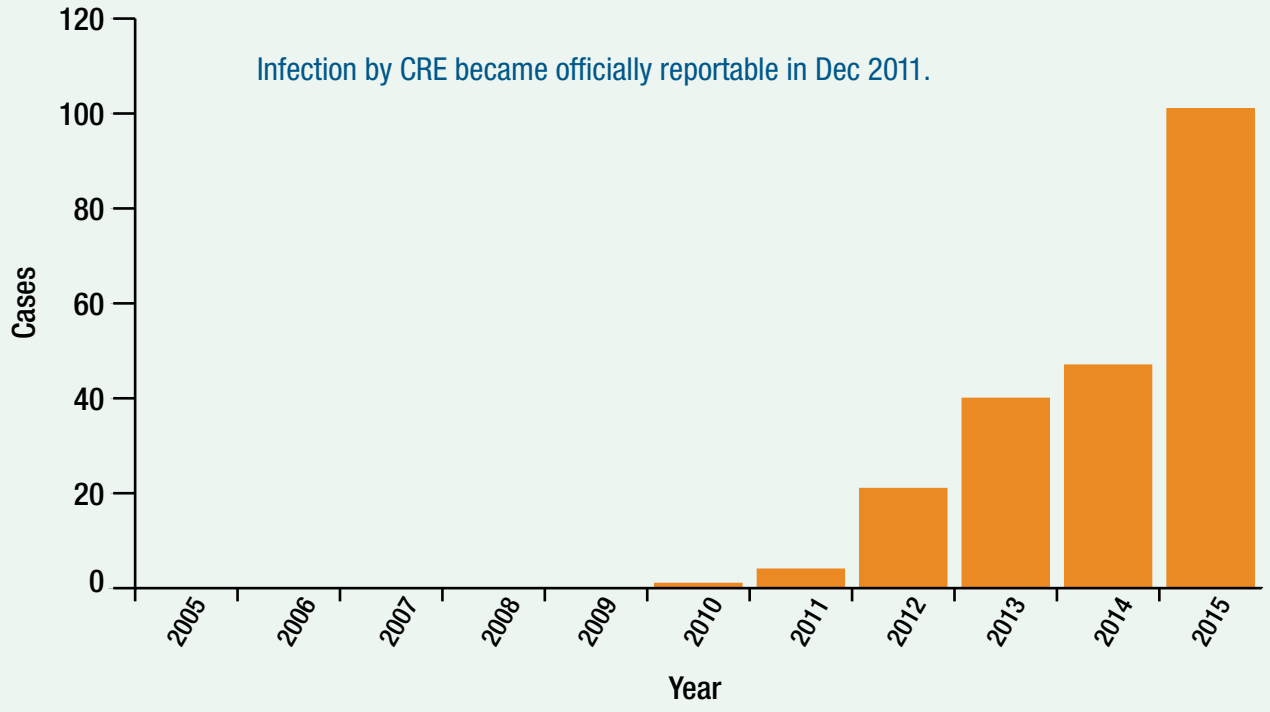
Two hundred ninety-seven cases of CRE infection or colonization were reported among Oregon residents from 2010–2015. The median case age was 71 (range 0–96) years; 193 (65%) were female — 152 (51%) were hospitalized at the time of, or within 30 days of specimen collection. Urine was the most common source (68%) and *Enterobacter* spp. accounted for >50% of all isolates.

By the end of 2015, Oregon had 10 CP-CRE; 7 *Klebsiella pneumoniae* carbapenemase (KPC), 1 New Delhi metallo-ß-lactamase (NDM), and 2 Oxacillinase-48 (OXA-48). Eight of the CP-CRE were from patients with histories of health care exposure in other states or out of the United States.

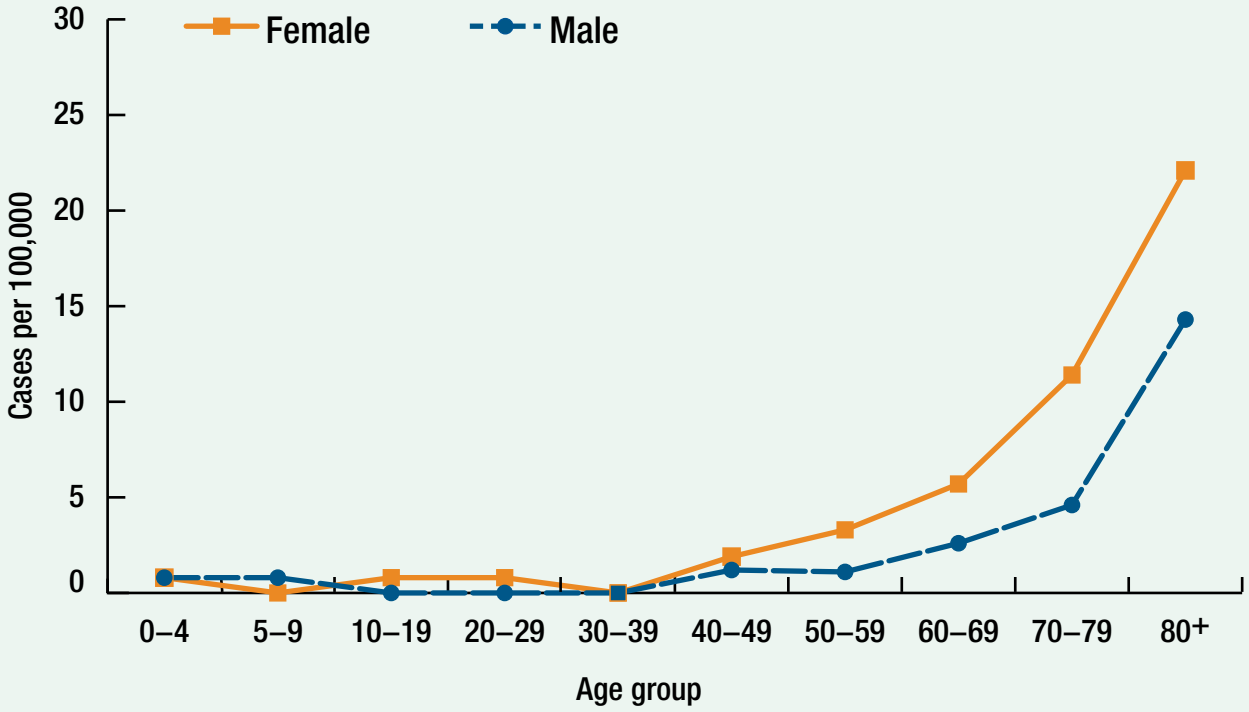
Unlike much of the rest of the country, we have no indication CP-CRE are spreading in Oregon. We have instituted enhanced surveillance and prevention efforts and established the Drug-Resistant Organism Prevention and Coordinated Regional Epidemiology Network (DROP-CRE), a statewide network to rapidly detect, respond to and prevent CRE.

For more information, including our CRE toolkit, please see Carbapenem-resistant *Enterobacteriaceae*.

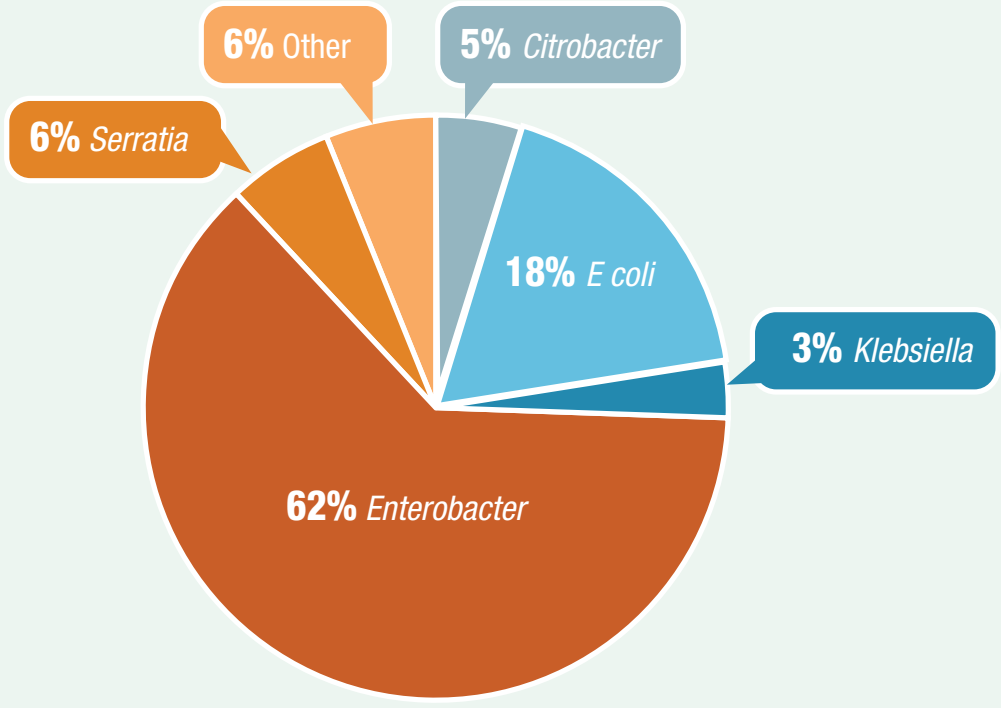
Carbapenem-resistant *Enterobacteriaceae* by year: Oregon, 2005–2015



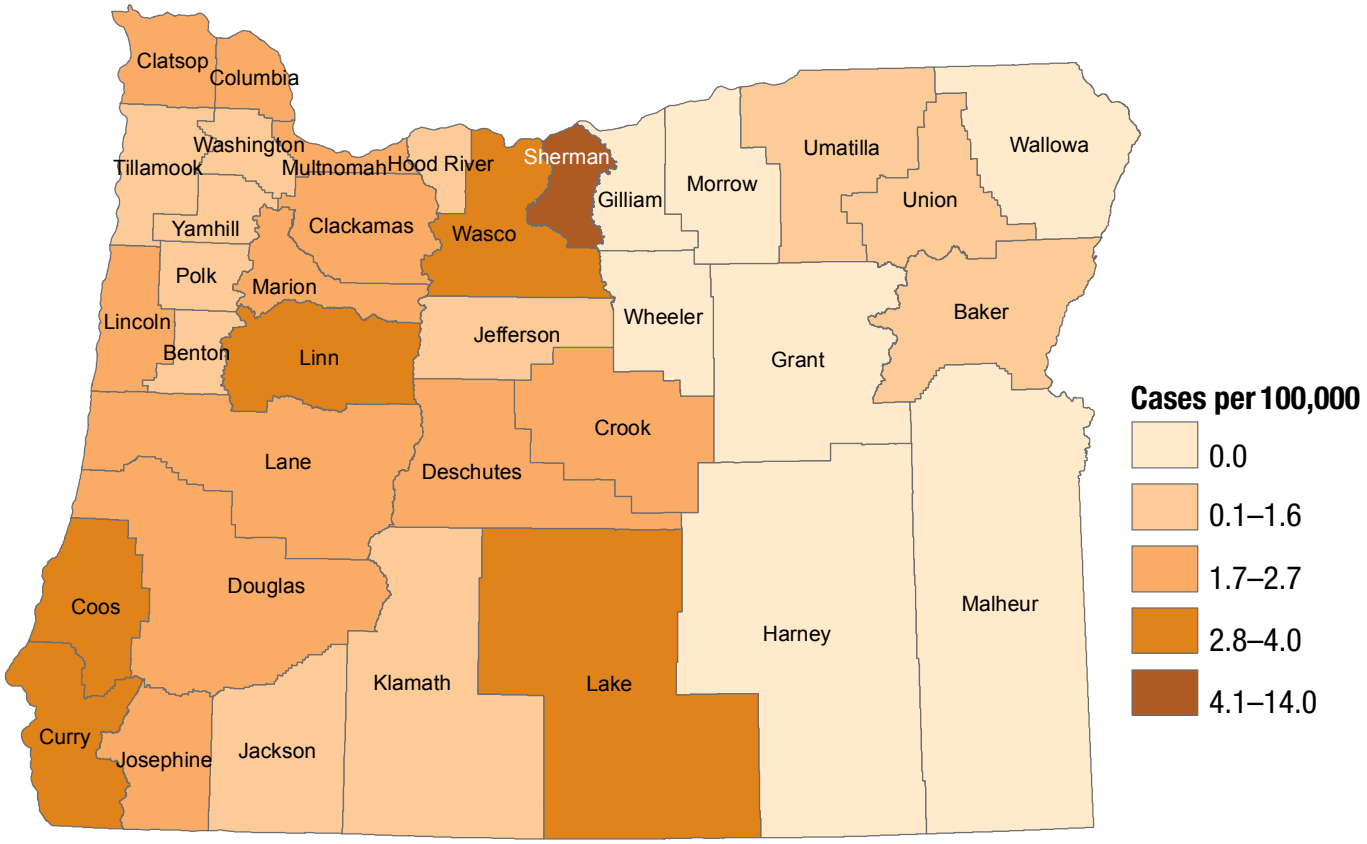
Incidence of carbapenem-resistant *Enterobacteriaceae* by age and sex: Oregon, 2015



Carbapenem-resistant *Enterobacteriaceae* by species: Oregon, 2015



Incidence of carbapenem-resistant *Enterobacteriaceae* by county of residence: Oregon, 2012–2015



Prevention

Think "NICE" if you encounter CRE:

- **Notify** the county health department, pertinent clinical groups, and your antibiotic stewardship program that CRE has been spotted.
- **Intervene** in all cases with core infection control activities: hand hygiene, contact precautions, private rooms and optimized environmental cleaning. Reduce unnecessary antibiotics and use of invasive devices. Additionally, for CP-CRE, screen patient contacts, and cohort staff and patients.
- **Communicate** CRE infection or colonization status to the receiving facility upon patient transfer.
- **Educate** patients, staff and visitors about CRE.

Cryptococcosis

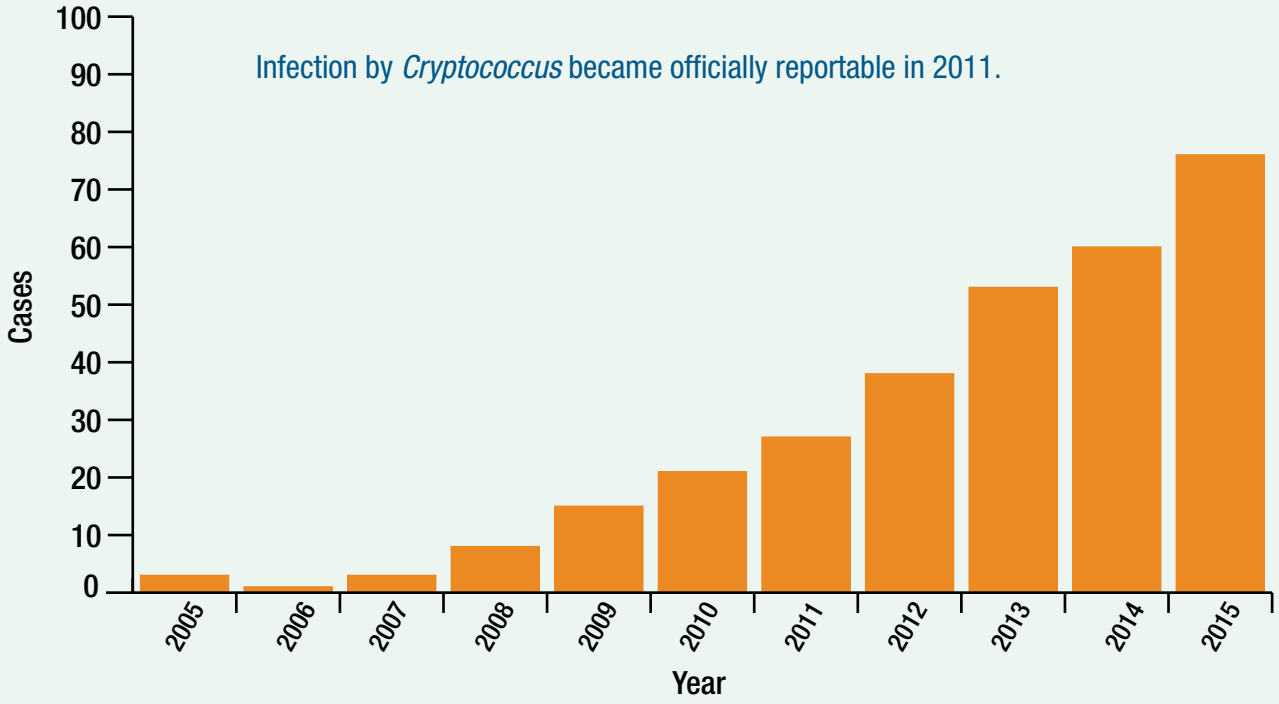
Cryptococcus neoformans has long been identified in humans with immunosuppressive conditions, especially AIDS. Before 1999, *Cryptococcus gatti (C. gatti)* infection seemed to be pretty much limited to the tropics. During 1999, *C. gattii* began appearing in animals and humans on Vancouver Island, British Columbia, Canada. Beginning in 2004, it started appearing among mainland British Columbia residents who had no exposure to Vancouver Island. In December 2004, a case of human *C. gattii* infection was reported in Oregon, associated with an outbreak on Vancouver Island and in mainland British Columbia. Infection by *Cryptococcus* became officially reportable in Oregon on August 19, 2011.

Seventy-six cases occurred among Oregon residents in 2015. The most common infection was *C. neoformans* (18), followed by *C. gatii* (14).

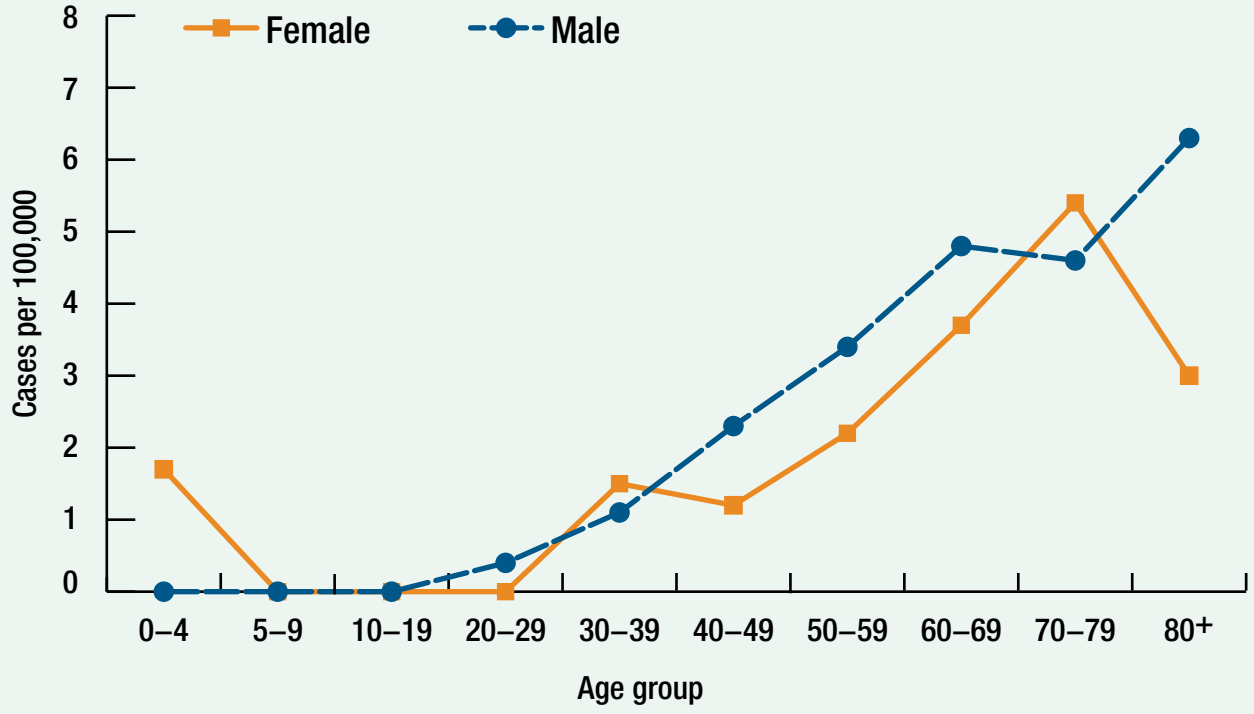
Studies from British Columbia and elsewhere showed a median incubation period of 6–7 months, with a range of 2–13 months. In addition to testing human specimens, we also test animals and environments where animals are infected with *C. gattii* to localize the environmental reservoirs (they travel less than humans). The bottom line is *C. gattii* appears to be established in Oregon soil and serves as a source of infection. There is no potential for zoonotic transmission.

Previously healthy persons appear to be at low risk. Most infections are among immunocompromised or chronically ill persons. Over the last few years, detection of cryptococcal infection has changed from culturing the organism to the use of cryptococcal antigen making it impossible to further our knowledge of the epidemiology of *Cryptococcus gattii.* Treatment with extended use of antifungal agents (six months or longer) is recommended. For current treatment information, see guidelines published by the Infectious Disease Society of America: http://www.idsociety.org/Index.aspx

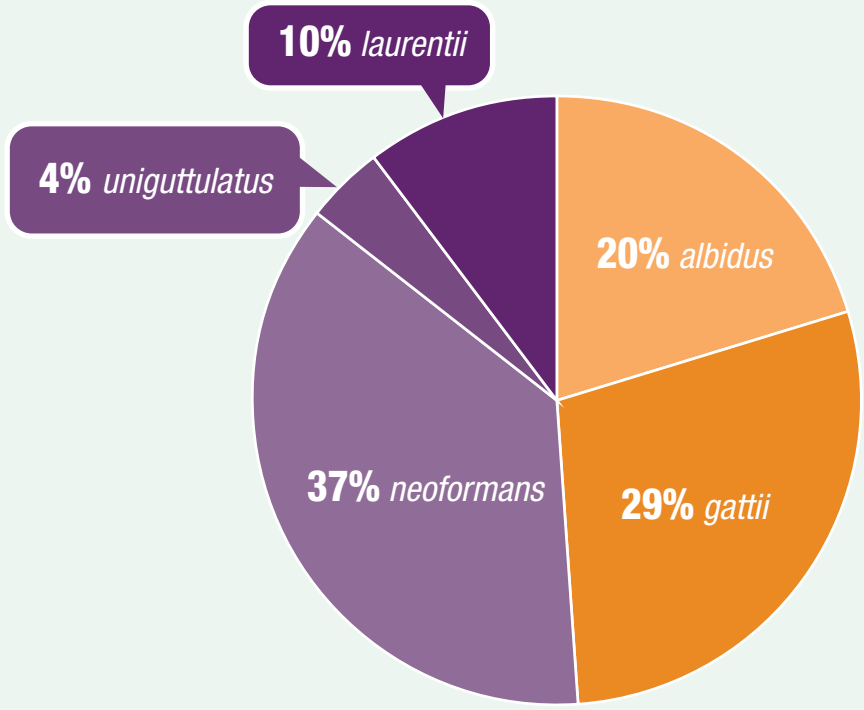
Cryptococcosis by year: Oregon, 2005–2015



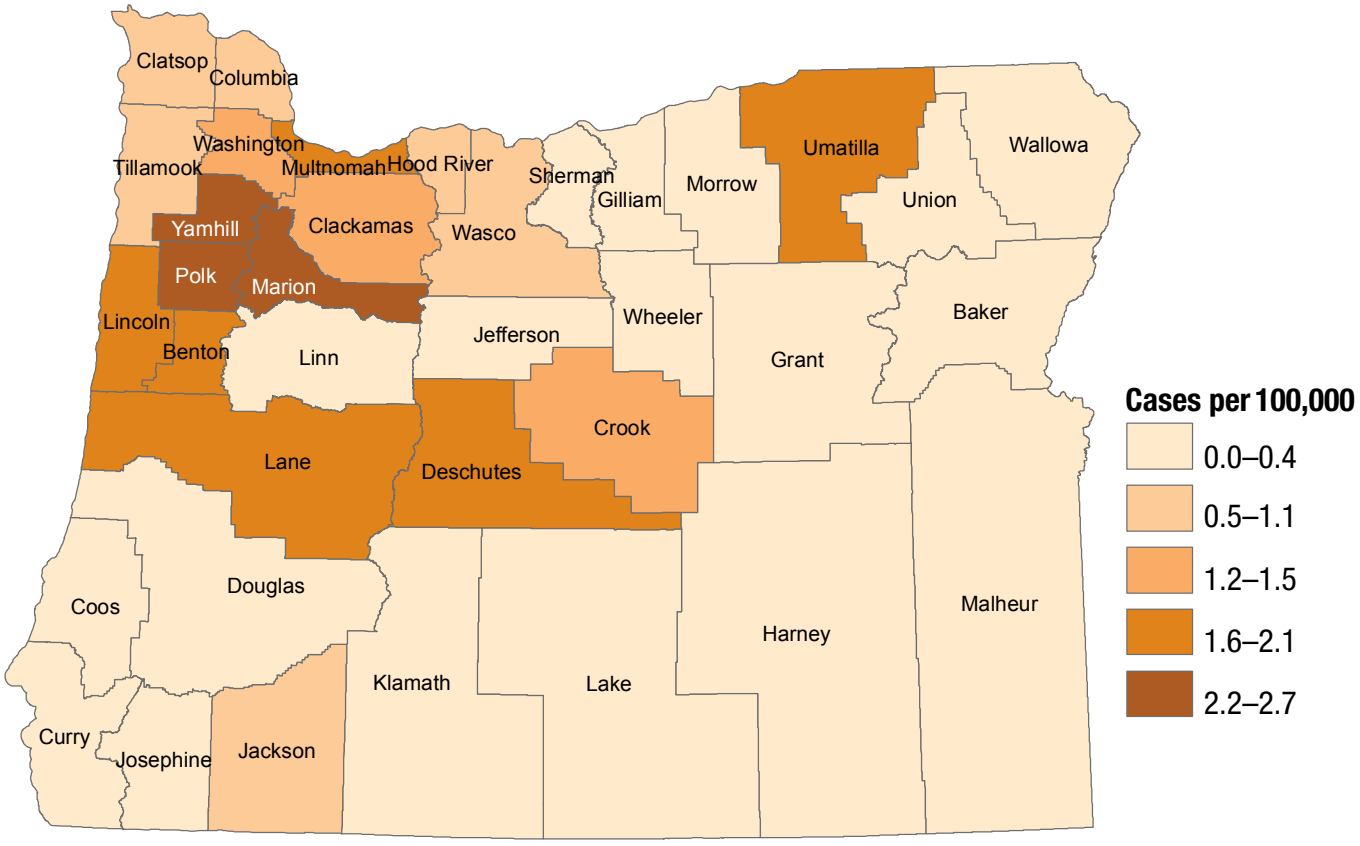
Cryptococcosis by age and sex: Oregon, 2015



Cryptococcosis by species: Oregon, 2015



Incidence of cryptococcosis by county of residence: Oregon, 2012–2015



Prevention

- Regrettably, practical methods for preventing cryptococcosis have not been identified.
- Patients with cryptococcosis can be helped with early diagnosis and treatment with antifungal drugs.

Cryptosporidiosis

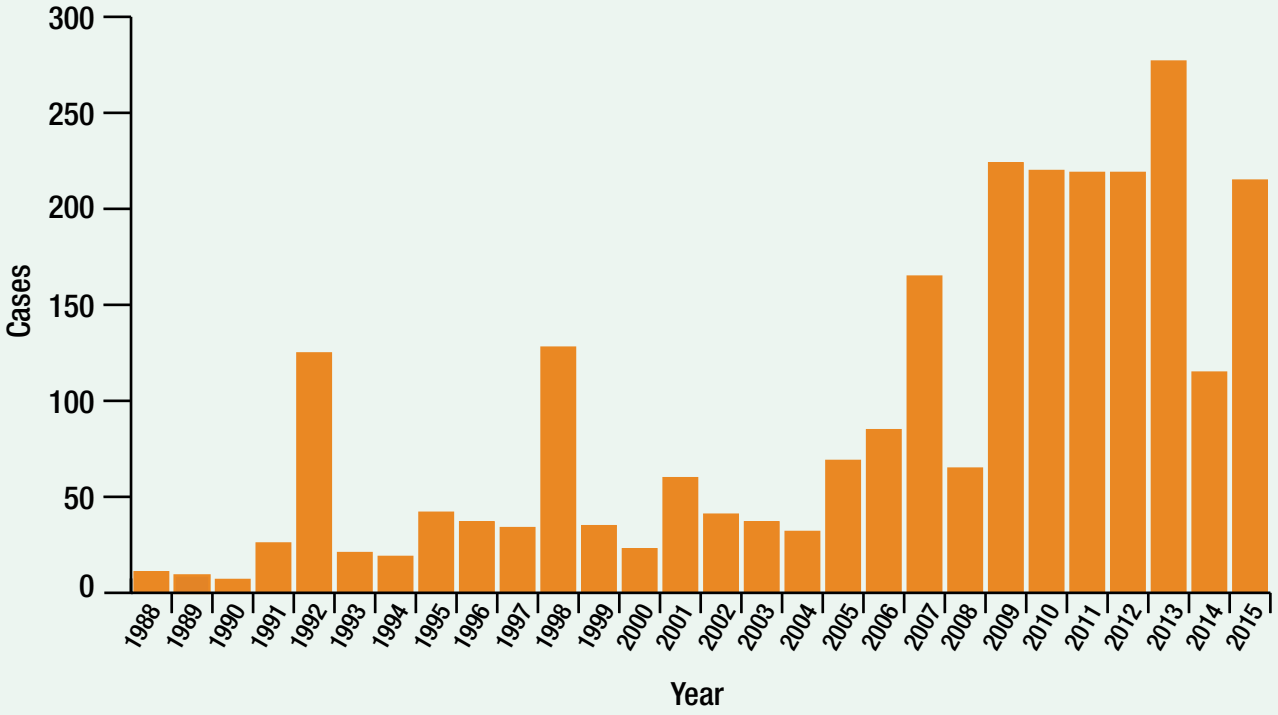
Cryptosporidiosis in humans results from infection with protozoal parasites of the genus *Cryptosporidium* — most commonly *C. hominis* or *C. parvum*. Symptomatic infections are characterized by watery diarrhea and abdominal cramps. Symptoms typically resolve in one to four weeks in immunocompetent persons, but infections in immunocompromised persons can be difficult or impossible to cure. Studies suggest the prevalence of cryptosporidiosis among young children, particularly those in large child care facilities, is surprisingly high. Many of these infections are asymptomatic.

In Oregon, the rate of infection with *Cryptosporidium* remains elevated from rates observed at the millennium, but the 2015 rate of 5.4 per 100,000 is regression to the mean after a lull in cases in 2014. Nationally, infections began to rise in the early millennium, but incidence has stabilized since 2009. Oregon incidence of *Cryptosporidium* remains twice the national rate (2.6 per 100,000 persons). Cases occur year-round with peaks in August, coincident with increases in exposure to recreational water.

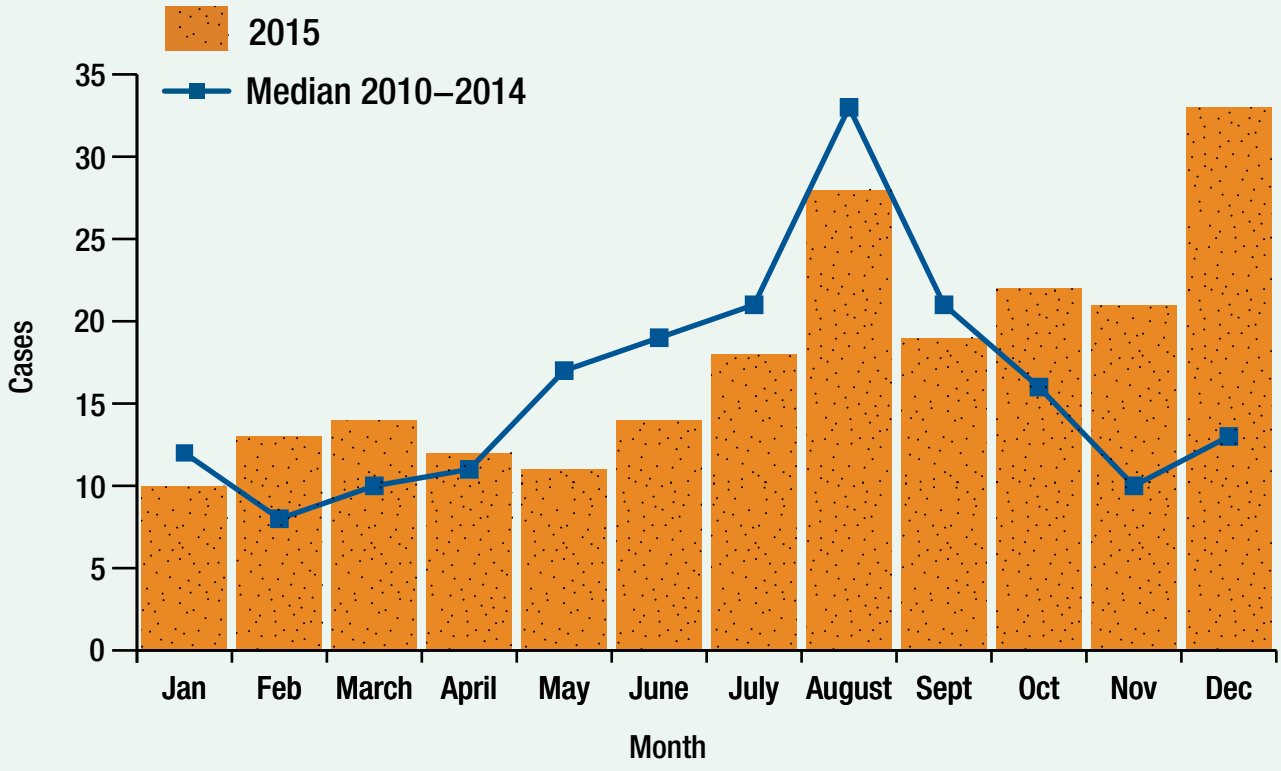
Rapid cartridge (ImmunoSTAT) tests for *Cryptosporidium* might be playing a role in the apparent increase in incidence. In 2015, 215 cases were reported. In 2007, the Oregon investigative guidelines were changed to reflect the increasing numbers of cases; previously, investigations had been required only for abnormally high case counts. All cases are now routinely investigated to identify the source of infection.

Treatment with an antiprotozoal agent has been shown effective in immunocompetent persons; however, there are no proven effective treatments in immunocompromised hosts.

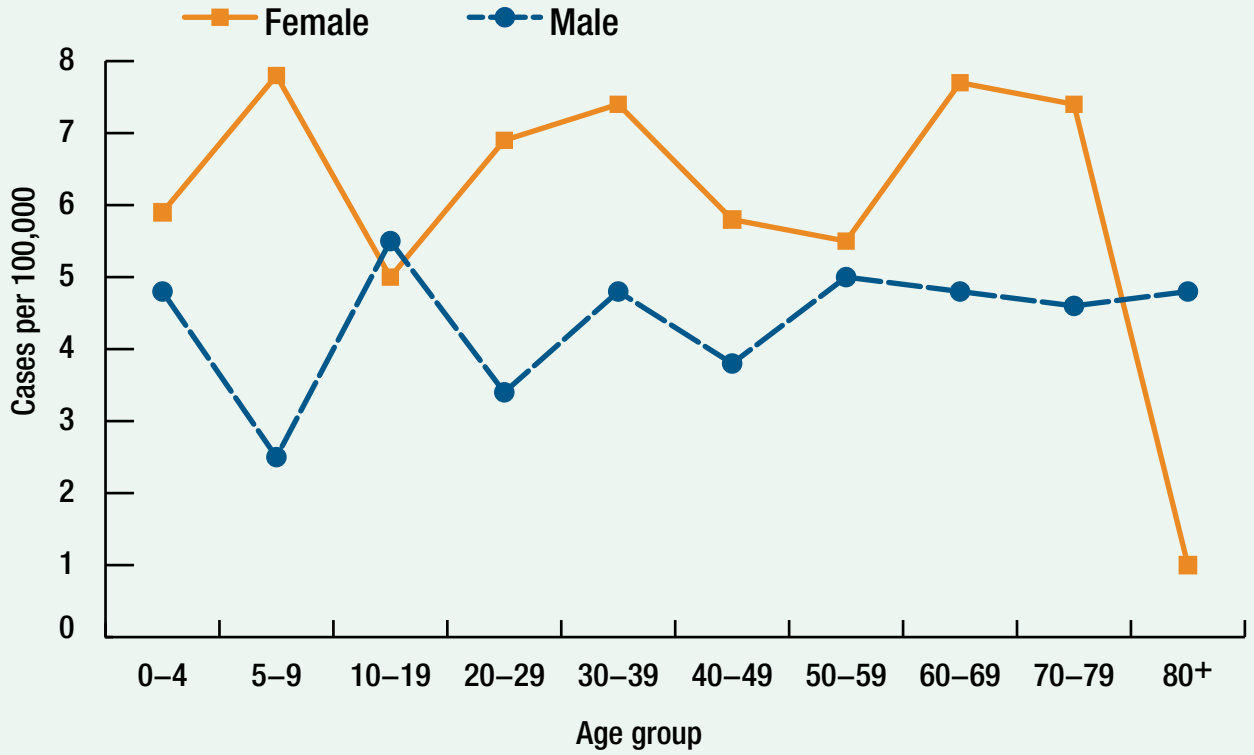
Cryptosporidiosis by year: Oregon, 1988–2015



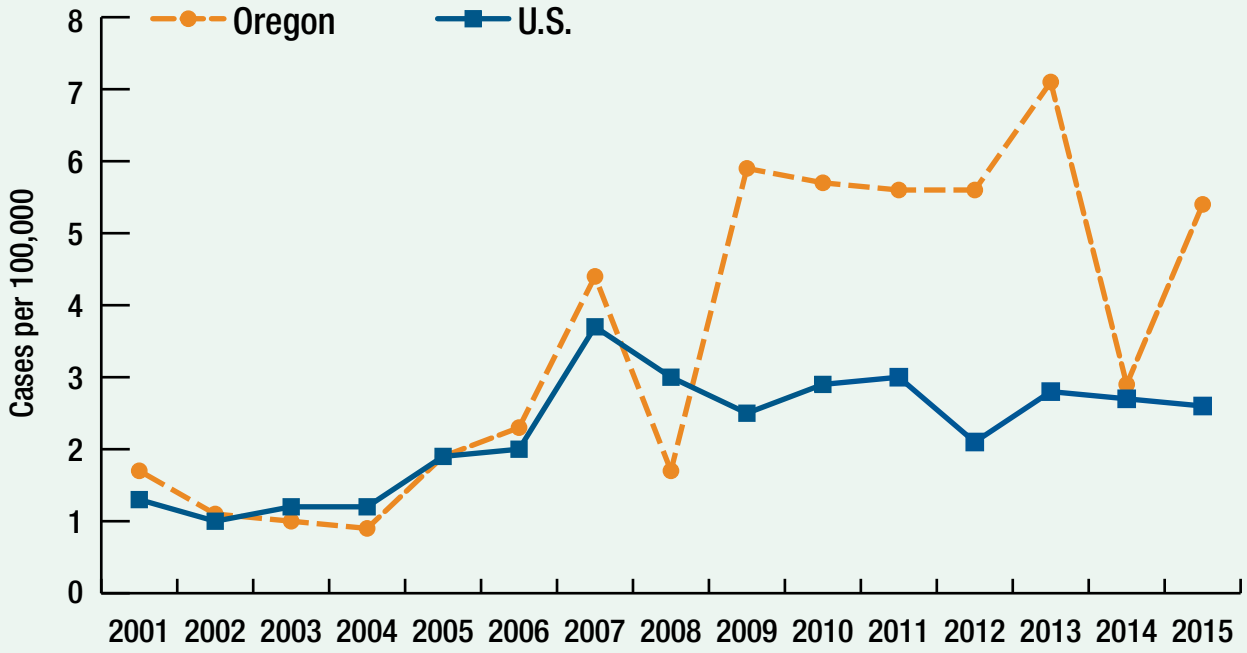
Cryptosporidiosis by onset month: Oregon, 2015



Incidence of cryptosporidiosis by age and sex: Oregon, 2015

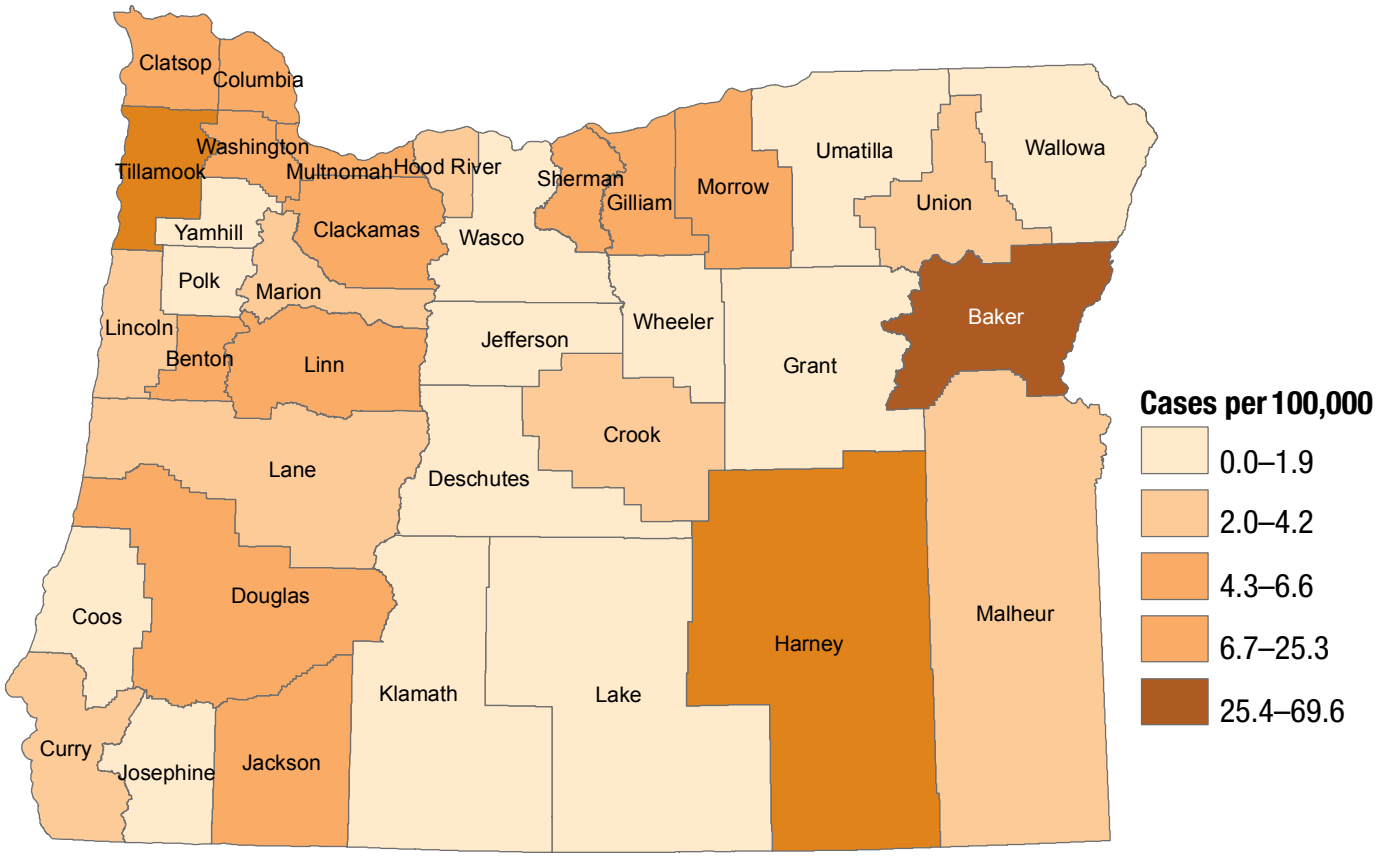


Incidence of cryptosporidiosis: Oregon vs. nationwide, 2001–2015



Oregon	1.7	1.1	1.0	0.9	1.9	2.3	4.4	1.7	5.9	5.7	5.6	5.6	7.1	2.9	5.4
U.S.	1.3	1.0	1.2	1.2	1.9	2.0	3.7	3.0	2.5	2.9	3.0	2.1	2.8	2.7	2.6

Incidence of cryptosporidiosis by county of residence: Oregon, 2006–2015



Prevention

- Wash hands with soap carefully and frequently, especially after going to the bathroom, after changing diapers or after touching livestock. Supervise hand washing of toddlers and small children after they use the toilet.
- Do not work or attend daycare, serve or prepare food, or work in health care while ill with diarrhea.
- Refrain from recreational water activities (pools, hot tubs, splash pads) for two weeks after symptoms from a bout of cryptosporidiosis subside.
- Do not drink untreated surface water.

Dengue fever

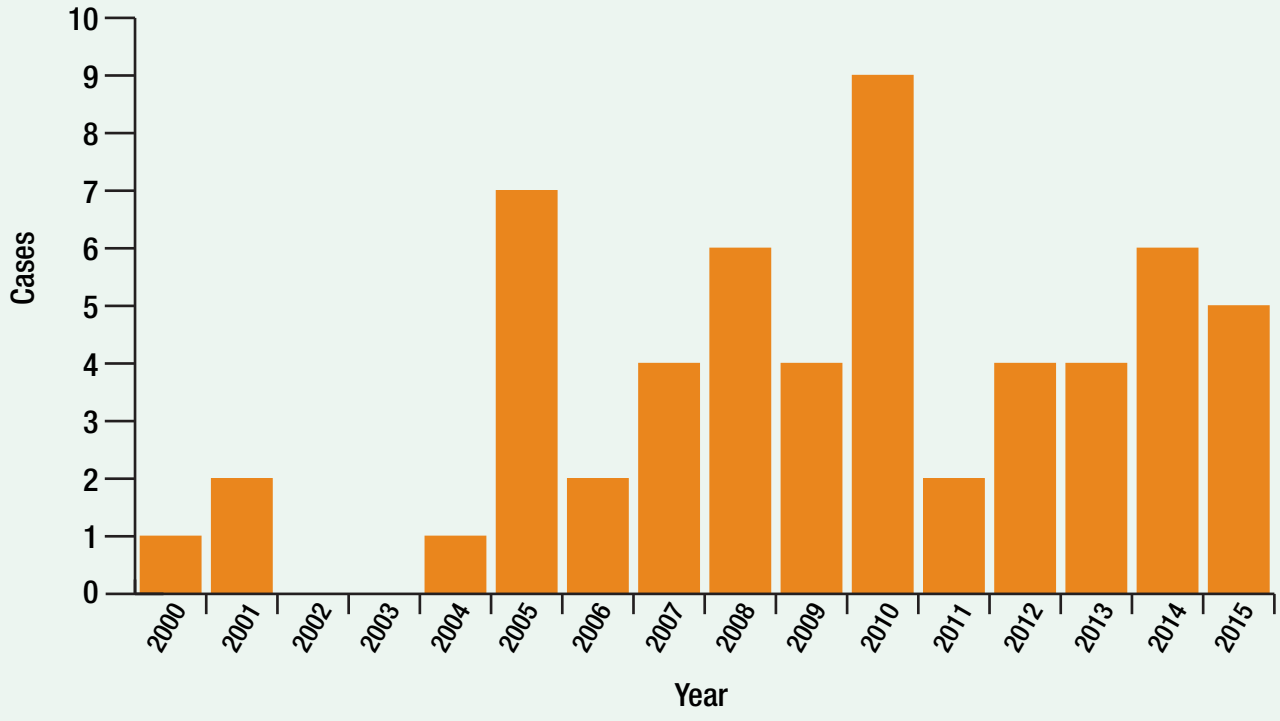
Dengue is a mosquito-borne viral infection. It is caused by a *Flavivirus* (the same genus as West Nile, Zika virus and yellow fever viruses); there are four serotypes, identified as DENV 1–4. The disease is limited primarily to the tropics and subtropics, although imported cases occasionally occur.

Symptom severity ranges from subclinical, asymptomatic infections to high fever, headache, muscle aches and rash. A subset of patients may develop hemorrhagic fever, with bleeding and shock. Treatment for dengue is supportive. There is, alas, no vaccine as yet that protects against dengue fever.

There is no evidence of transmission here in Oregon. The typical vectors, *Aedes albopictus, Aedes japonicus* and *Aedes aegypti,* are not native to Oregon, although there have been reports of all three species in California.

Five cases in Oregon residents were reported in 2015. All had a history of recent travel to Costa Rica, Dominican Republic, Indonesia, Mexico and the Philippines.

Dengue infection by year: Oregon, 2000–2015



Prevention

Primary prevention measures are geared to avoiding mosquito bites when visiting areas where dengue is circulating:

- Use mosquito repellent.
- Wear long sleeves, long pants, shoes and socks when out and about.
- Avoid outdoor activities at dawn, dusk, and early evening, when more mosquitoes are out.
- Check screens on doors and windows where you're staying to make sure they're intact.
- Sleep under a treated mosquito net when nighttime exposure to mosquitoes could occur.
- Additionally, persons acutely ill with dengue should avoid exposure to domestic mosquitoes. (We don't want to find out the hard way that local species can harbor and transmit the virus, after all.)

Escherichia coli O157 and other Shiga toxin-producing *Escherichia coli* (STEC) infections

Escherichia coli O157 (O157) is one of the most dreaded causes of infectious gastroenteritis. Bloody diarrhea is a hallmark of this pathogen, but the real danger is post-diarrheal hemolytic uremic syndrome (HUS). Oregon has been the setting for many O157 outbreaks, and the investigations of those outbreaks, combined with the analysis of other surveillance data, have contributed greatly to our understanding of this pathogen. Spread by the fecal-oral route, O157 has a number of animal reservoirs, the most important of which are ruminants: cattle, goats, sheep, deer, elk, etc. Transmission often occurs from consumption of contaminated food or water, as well as direct person-to-person spread and environmental exposures. Mid-to-late summer is the peak season for O157 infections.

With increasing deployment of diagnostic kits that identify Shiga toxin-producing *E. coli* (rather than O157 per se) comes an appreciation of the significant role that other STEC play as human pathogens. In the U.S. (and in Oregon), O26, O45, O103, O111, O121 and O145 are the most common "other" serogroups of the enterohemorrhagic *E. coli* making up about half of the reported cases. O157 infections are much more likely to result in HUS than is infection by STEC.

Over the past 10 years, the number of O157 cases reported statewide has ranged between 57 and 106 annually. After being relatively steady during 2008–2011, the rate began to increase with a peak of 2.7 per 100,000 in 2013. In 2015, the rate was 2.6 per 100,000 persons.

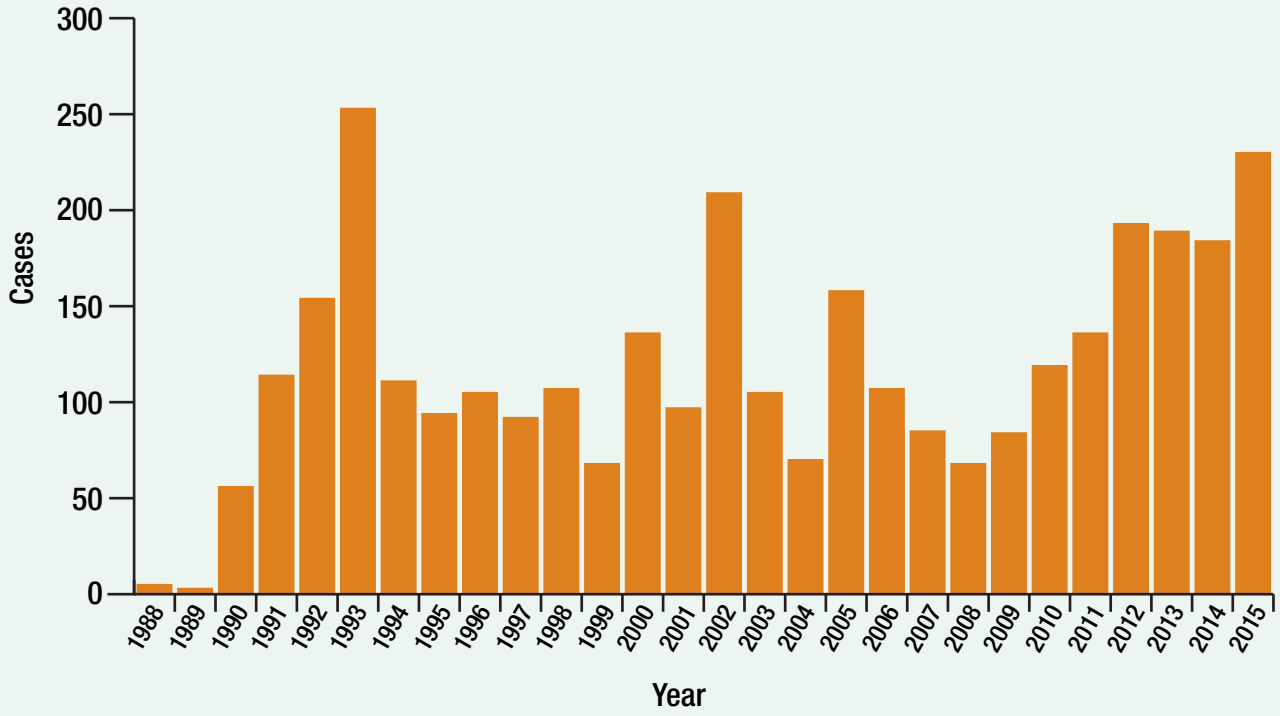
As for the non-O157 serogroups, those case counts have increased steadily from single digits in 2007 and 2008 to 109 confirmed cases in 2015. Of the 215 confirmed STECs serotyped in 2015, 106 were O157, 101 were non-O157, including O26 (56), O103 (17), O121 (10) and 18 other serogroups.

Four STEC outbreaks were investigated in 2015; two were foodborne.

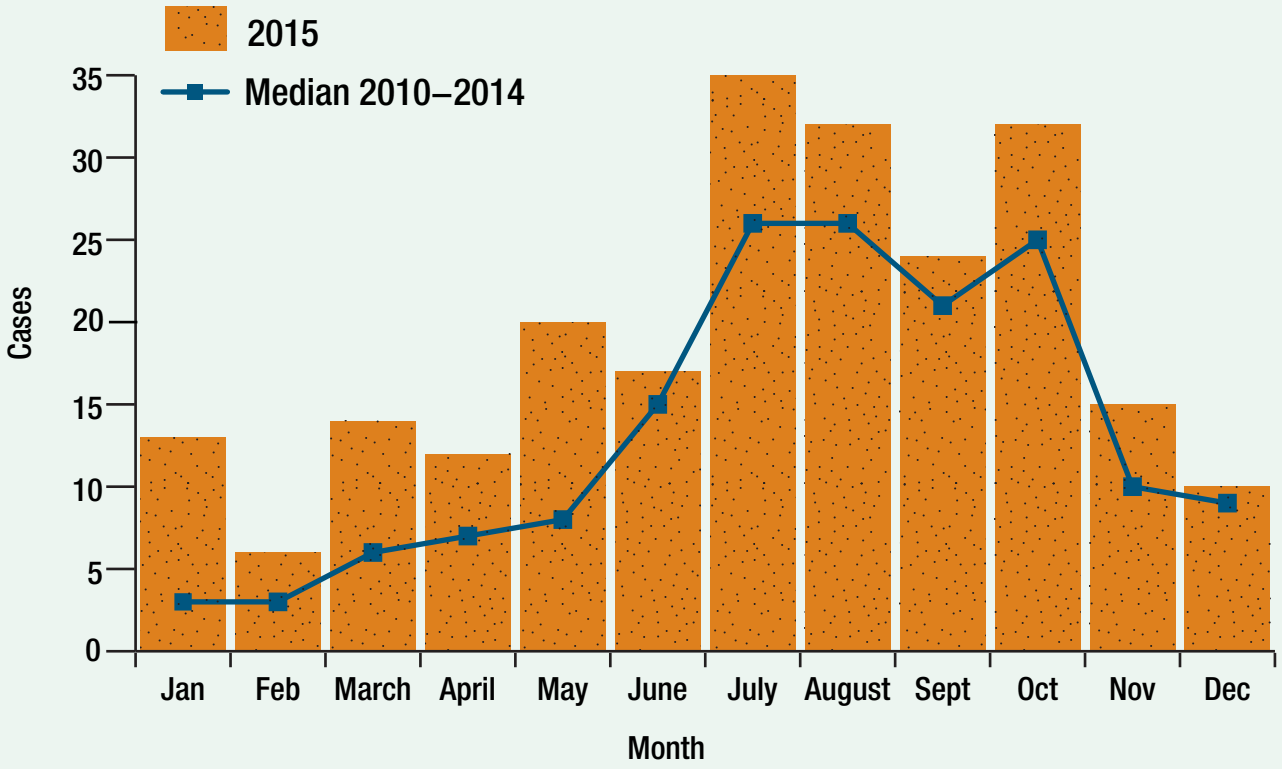
More labs are testing for the presence of Shiga toxin rather than just O157. Unfortunately, at the same time, many labs are dropping culture-based methods, leaving clinicians (and epidemiologists) in the dark as to the specifics of the etiologic agent, and putting more of the diagnostic burden on the public health reference lab.

Much of the heavy lifting for prevention must be done upstream, with plans to minimize contamination of crops and processing equipment. Hazard Analysis and Critical Control Point (HACCP) practices focus on documenting and controlling risks during food processing and commercial food preparation, as well as efforts to control water and other potential environmental sources of infection.

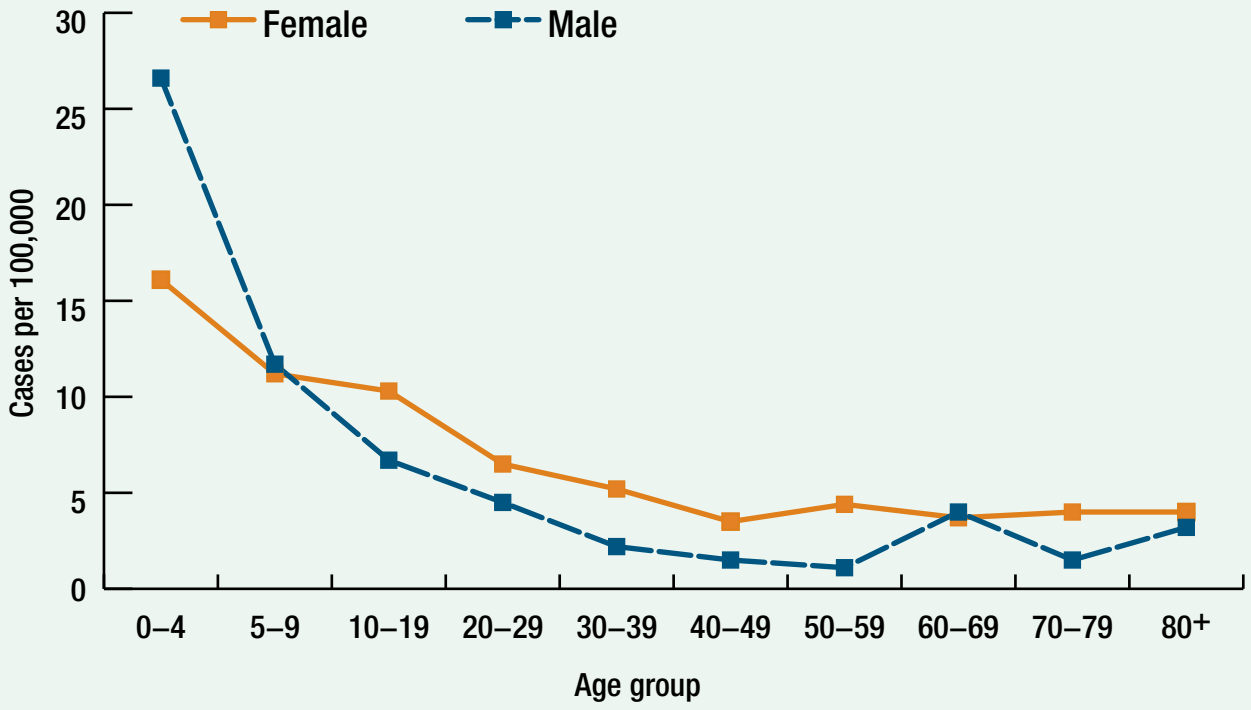
STEC infection (including *E. coli* O157) by year: Oregon, 1988–2015



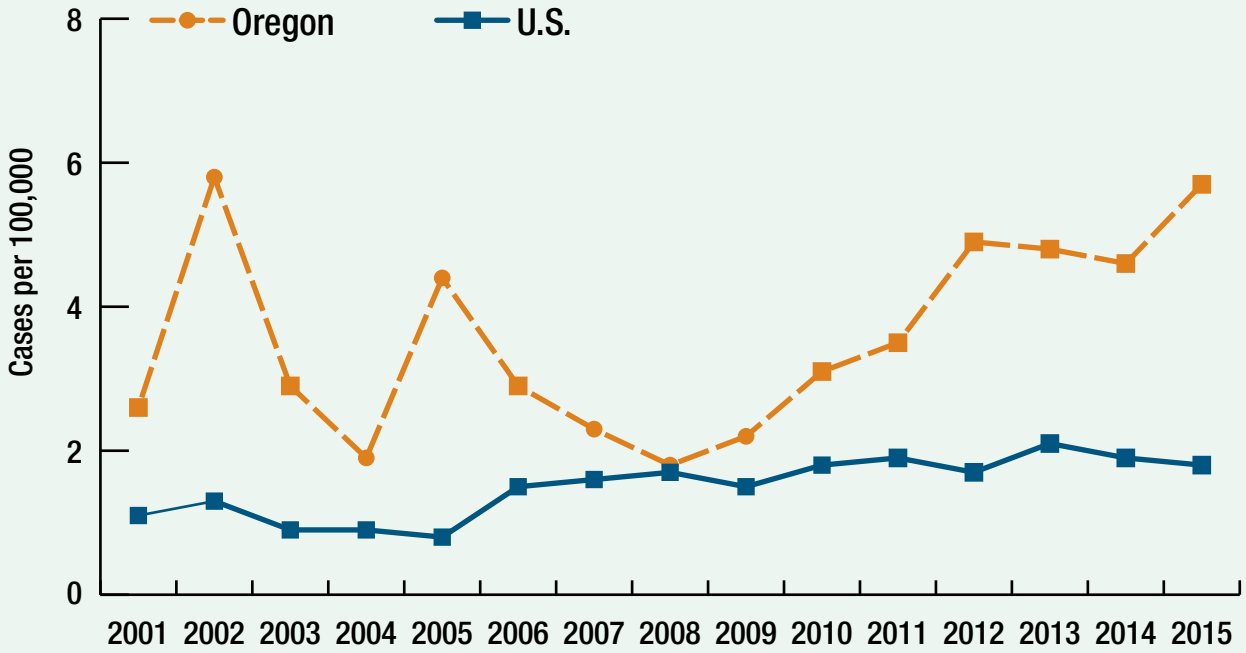
STEC infection by onset month: Oregon, 2015



Incidence of STEC infection by age and sex: Oregon, 2015

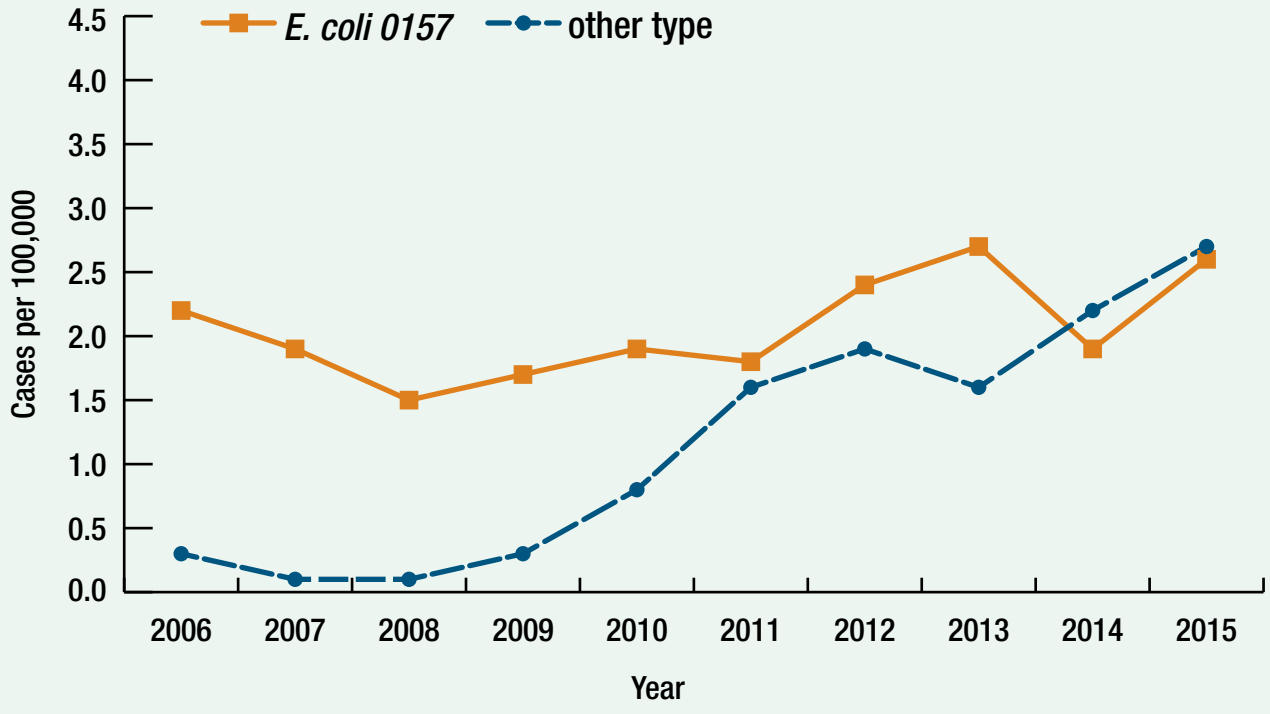


Incidence of STEC infection: Oregon vs. U.S., 2001–2015

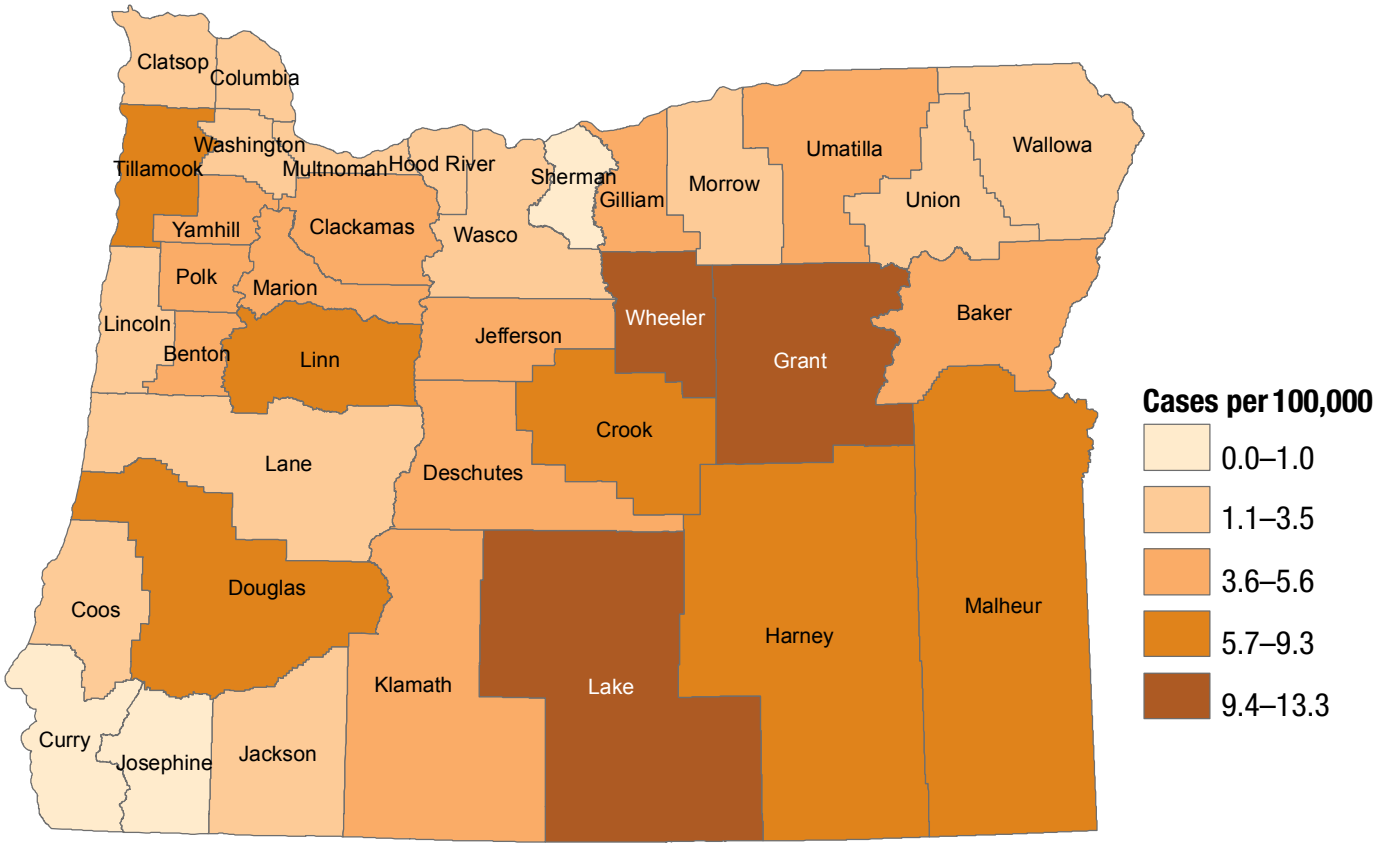


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	2.6	5.8	2.9	1.9	4.4	2.9	2.3	1.8	2.2	3.1	3.5	4.9	4.8	4.6	5.7
U.S.	1.1	1.3	0.9	0.9	0.8	1.5	1.6	1.7	1.5	1.8	1.9	1.7	2.1	1.9	1.8

Incidence of STEC infection, O157 vs. non-O157 type: Oregon, 2006–2015



Incidence of STEC infection by county of residence: Oregon, 2006–2015



Prevention

- Wash hands with soap carefully and frequently, especially after going to the bathroom, after changing diapers or after touching livestock. Supervise hand washing of toddlers and small children after they use the toilet.
- Do not work or attend daycare, serve or prepare food, or work in health care while ill with diarrhea.
- Practice safe food handling. Rinse raw produce thoroughly under running tap water; separate uncooked meats from vegetables, cooked foods and ready-to-eat foods; and cook meat to the proper temperatures.
- Do not drink raw milk and do not eat foods that have unpasteurized milk in them.

Extrapulmonary nontuberculous mycobacterial disease (NTM)

Oregon surveillance for extrapulmonary nontuberculous mycobacterial disease (NTM) started in January of 2014. Case reporting is used to identify outbreaks and potential sources of transmission, and prevent further transmission. Other objectives are to identify epidemiologic trends and to educate the exposed persons about signs and symptoms of disease.

NTM are environmental organisms, usually associated with water and soil; there are more than 100 different species identified. Disease causing *Mycobacterium* species frequently identified in the United States include: *M. avium* complex (MAC), *M. marinum, M. abscessus, M. chelonae, M. fortuitum,* and *M. kansasii* and *M. xenopi* (in certain regions).

Extrapulmonary NTM disease presents as cutaneous, bone, joint, lymph node or central nervous system disease. Cutaneous infections typically result from either direct inoculation during trauma, surgical or medical procedures; exposures to whirlpool baths; or settings such as nail salons or tattoo procedures. These soft tissue infections cause purplish nodules that drain and may ulcerate or scar.

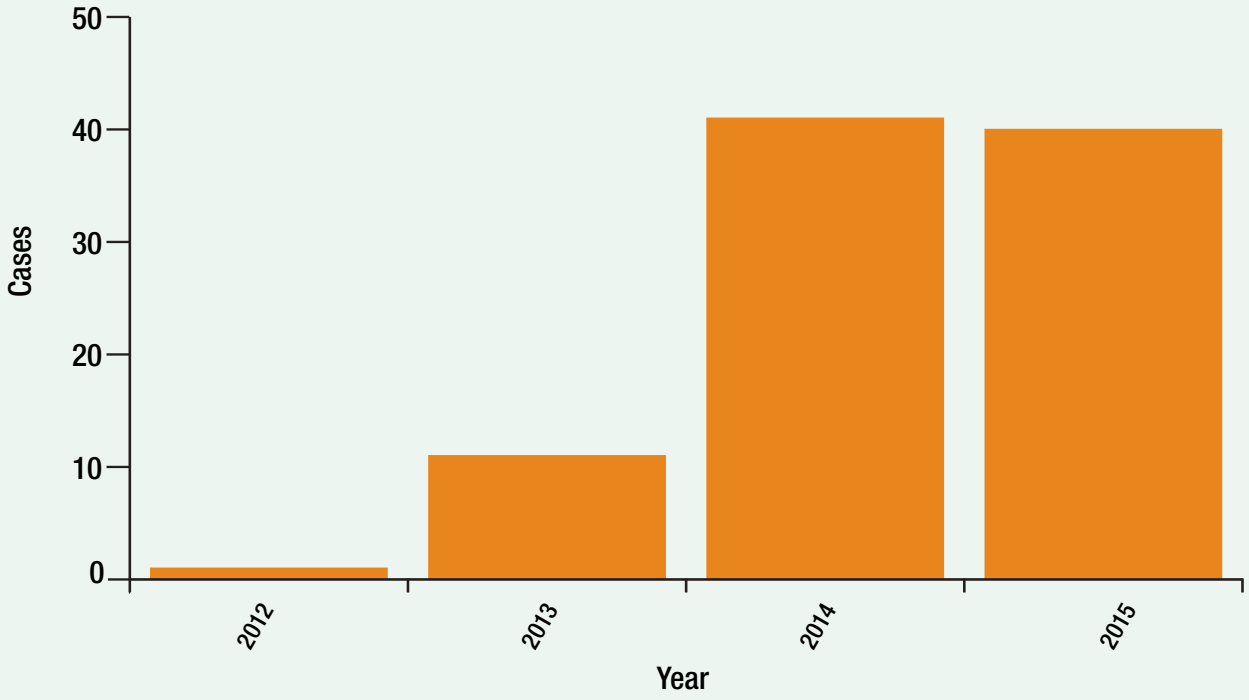
Lymphadenitis occurs most in otherwise healthy children, usually <5-years-old. Lymph node disease results in large, reddened and tender nodes, which can drain or ulcerate. The high rate of NTM in Oregon children <5 years is consistent with reports in the literature. These cases were predominately cervical lymphadenitis in otherwise healthy children.

Generally, disseminated extrapulmonary disease occurs in immunocompromised patients, (e.g., HIV, cancer, transplant and others). Symptoms include cough, fatigue, weight loss, fever and night sweats.

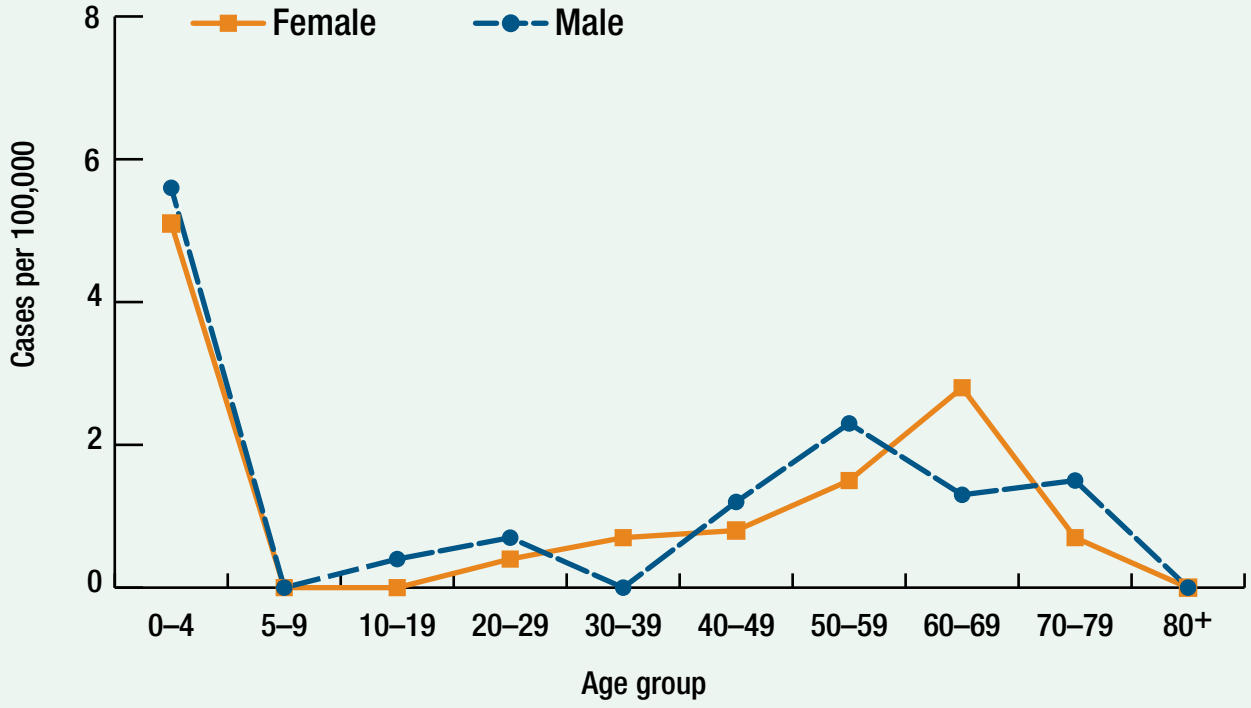
Treatment is based upon the species identified and the site of infection. For the immunocompetent, infections are usually curable with a two to three drug regimen for two to six months, depending on site of infection. Susceptibility testing of the organism determines the appropriate antibiotic treatment. For those with disseminated disease, cure is difficult to achieve without restoration of the immune system.

Ninety-eight cases of extrapulmonary NTM were reported among Oregon residents in 2014 and 2015. The median case age was 55 (range 1–92) years; 51 (52%) were female; 37 (38%) were hospitalized at the time of specimen collection. Tissue and wound cultures accounted for 46 (47%) of the cases. MAC was the most frequently reported species 42 (43%); 16 of those were from children 1–4 years of age. Three NTM clusters were detected. One was an *M. fortuitum* cluster, which included seven cases who had prosthetic joint replacement surgery; two cases of *M. fortuitum* associated with abdominoplasty in an ambulatory surgery center; and two *M. haemophilum* cases associated with a tattoo parlor.

Incidence of extrapulmonary nontuberculous mycobacterial disease (NTM) by year: Oregon, 2012–2015



Incidence of extrapulmonary nontuberculous mycobacterial disease (NTM) by age and sex: Oregon, 2015



Prevention

- For surgical procedures, follow infection prevention best practices; includes following sterilization guidelines and not using tap water or ice in the operating room.
- Avoid dusts from potting soil.
- Adequately clean baths in nail salons.
- Tattoo ink should be diluted with sterile water.

Giardiasis

Giardia intestinalis, the flagellated protozoan originally named *G. lamblia,* is the most commonly identified parasitic pathogen in the United States. Children in daycare and their close contacts are at greatest risk, as are backpackers and campers (from drinking unfiltered, untreated water), persons drinking from shallow wells, travelers to disease-endemic areas and men who have sex with men.

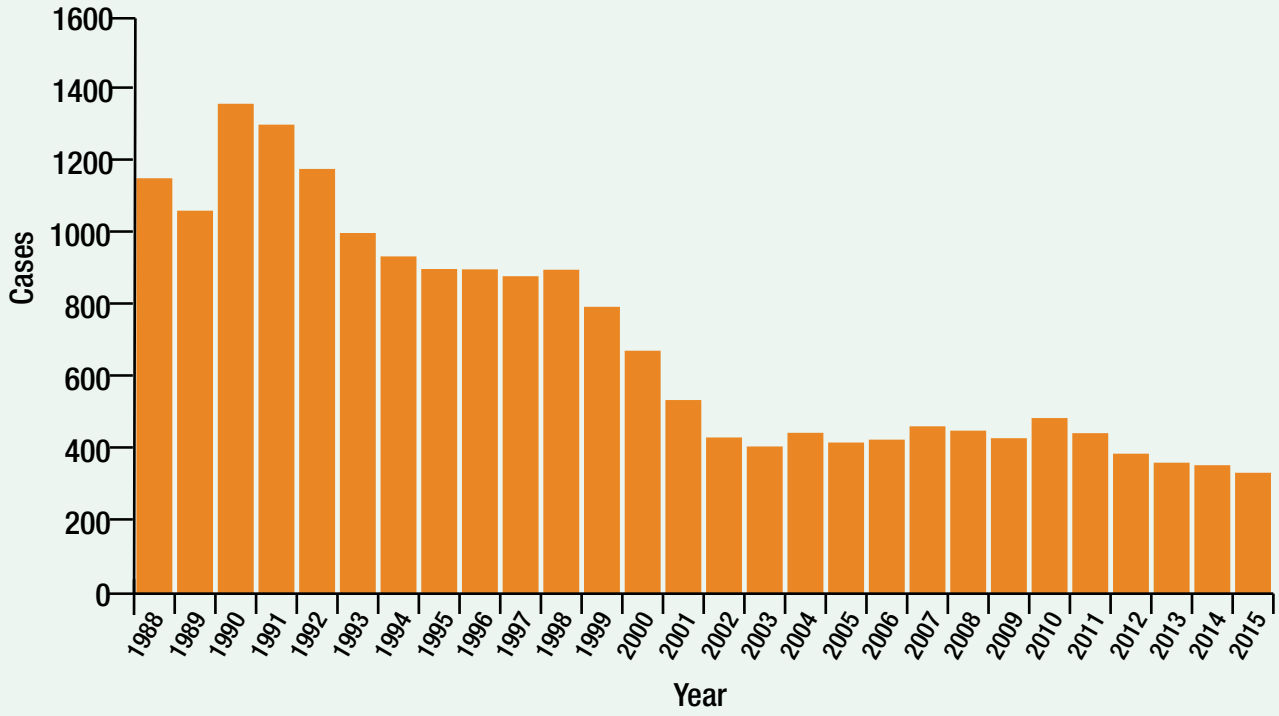
Giardia cysts can be excreted in the stool intermittently for weeks or months, resulting in a protracted period of communicability. Transmission occurs when as few as 10 cysts are ingested through person-to-person or animal-to-person contact, or by ingesting fecally contaminated water or food. Because most human cases follow person-to-person transmission, identification and treatment of giardiasis as well as management of their contacts should prevent further spread of infection.

Most *Giardia* infections occur without symptoms. When symptomatic, patients report chronic diarrhea; steatorrhea; abdominal cramps; bloating; frequent loose and pale, greasy stools; fatigue and weight loss.

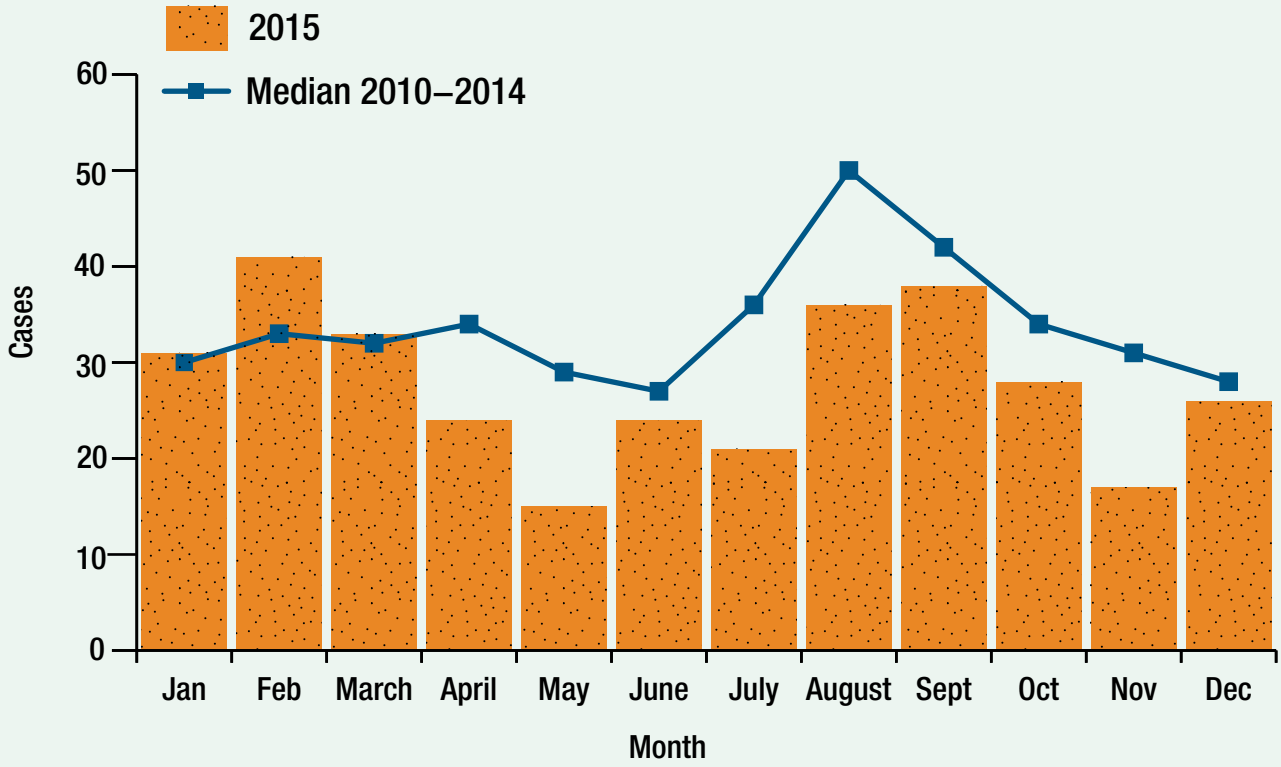
In 2015, the reported incidence of giardiasis in Oregon remained twice that of the rest of the U.S., with 8.3 cases per 100,000 persons. During 2015, 95% of the cases were reported as "sporadic" and 5% as household-associated; no outbreaks were reported. Children aged 5–9 years had the highest incidence in 2015, with 12 cases per 100,000 population. Rates of infection tend to be higher in the summer months with transmission related to outdoor activities in or near untreated water.

Giardiasis is treatable, though treatment fails 10% of the time. Treatment failure, however, is not thought to indicate resistance. A repeat course of the same or another medication may work.

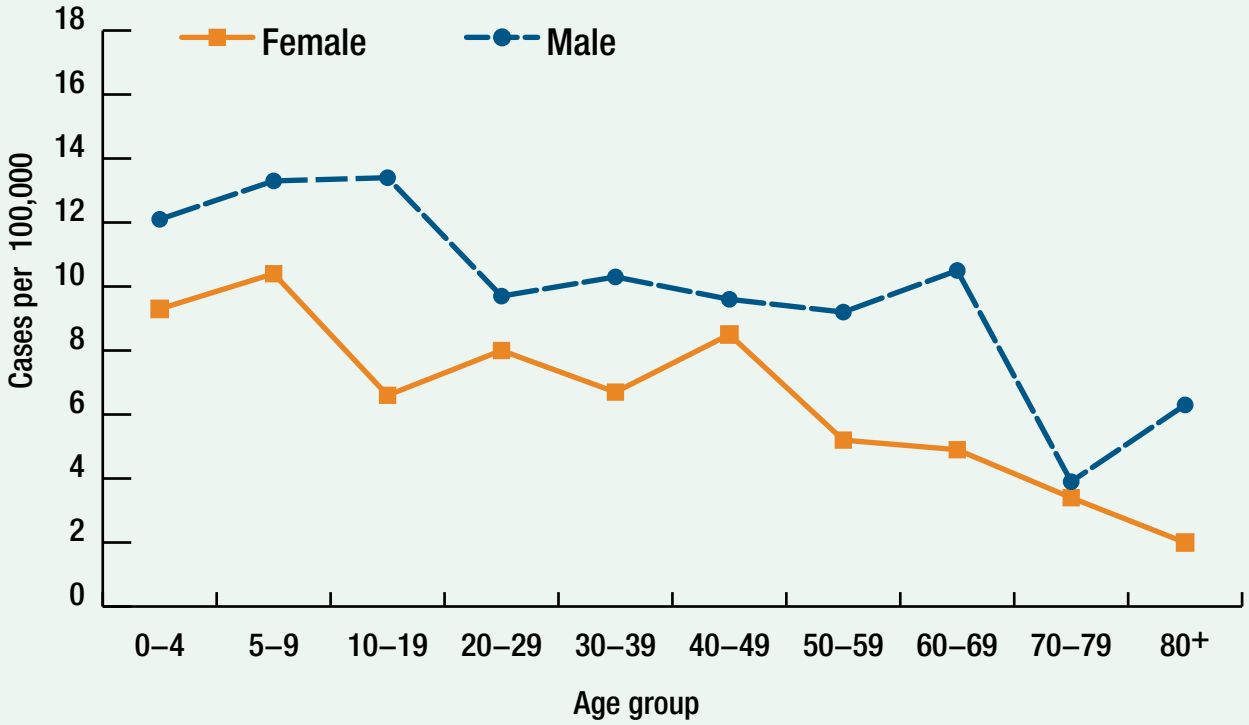
Giardiasis by year: Oregon, 1988–2015



Giardiasis by onset month: Oregon, 2015



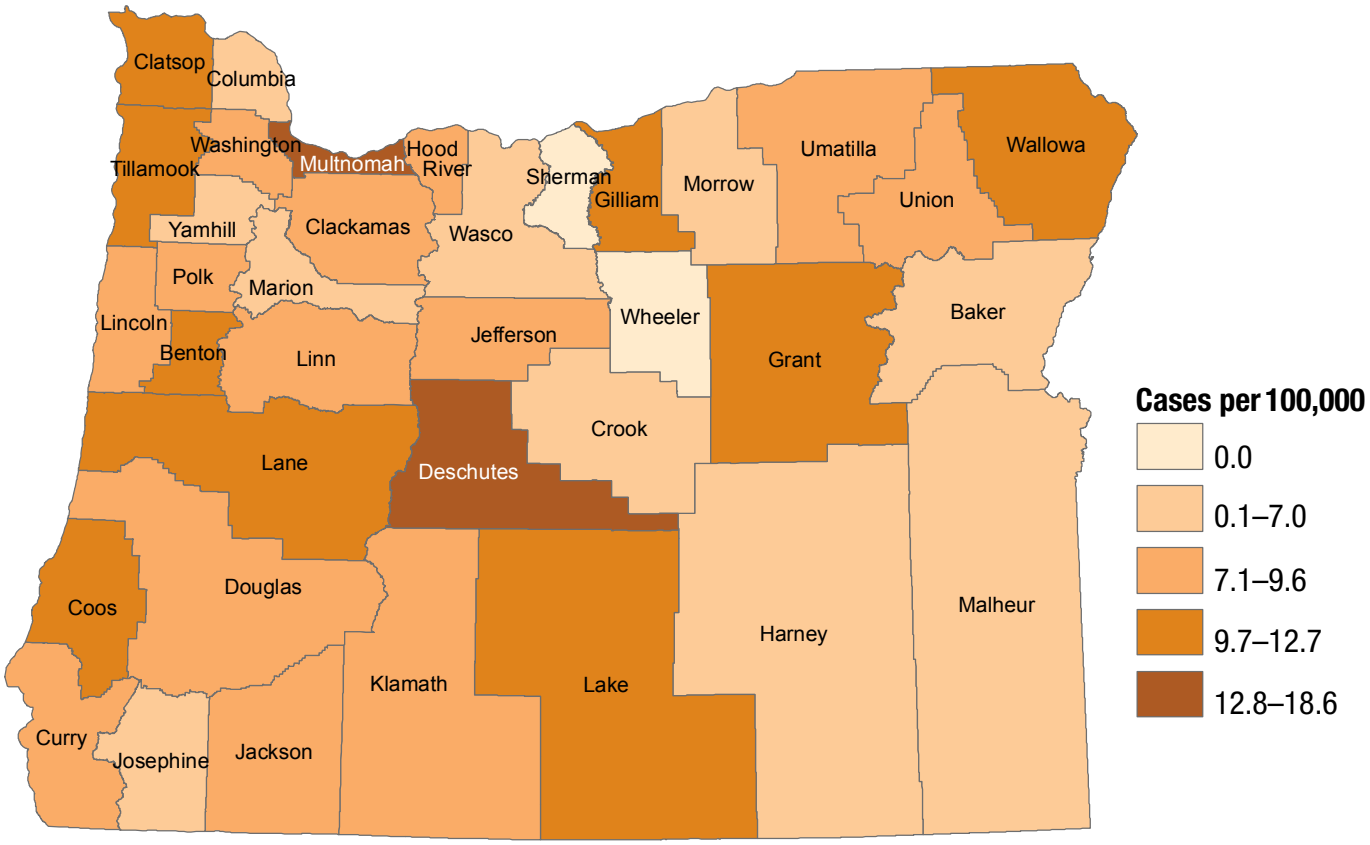
Incidence of giardiasis by age and sex: Oregon, 2015



Incidence of giardiasis: Oregon vs. nationwide, 2001–2015

Oregon	15.4	12.3	11.5	12.4	11.5	11.5	12.4	11.9	11.2	12.6	11.4	9.9	9.2	9.0	8.3
U.S.	—	7.3	6.7	7.0	6.7	6.3	6.4	6.1	6.3	6.5	5.3	4.0	4.7	4.5	3.7

Incidence of giardiasis by county of residence: Oregon, 2006–2015



Prevention

- Wash hands with soap carefully and frequently, especially after going to the bathroom, after changing diapers or after touching livestock. Supervise hand washing of toddlers and small children after they use the toilet.
- Do not work or attend daycare, serve or prepare food, or work in health care while ill with diarrhea.
- Refrain from recreational water activities (pools, hot tubs, splash pads) for two weeks after symptoms from a bout of giardiasis subside.
- Do not drink untreated surface water.

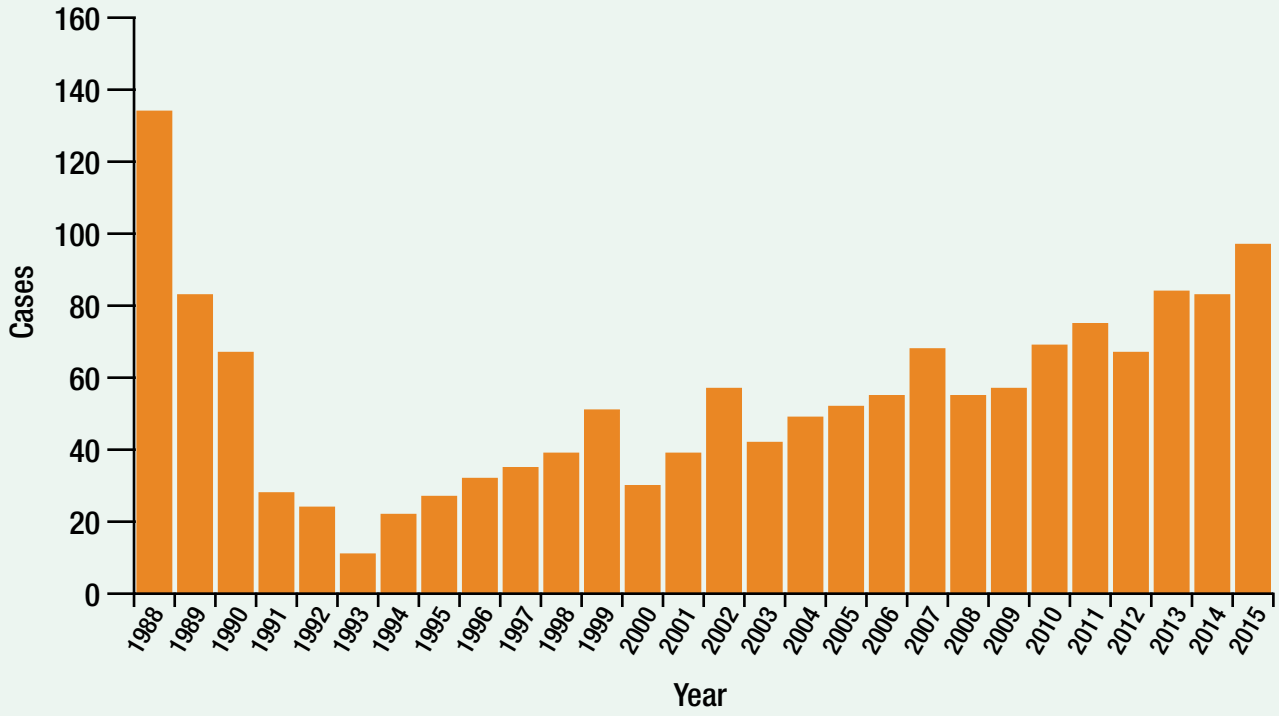
Haemophilus influenzae infection

Until the advent of an effective vaccine against *Haemophilus influenzae* serotype b (Hib) organisms, *H. influenzae* was the leading cause of bacterial meningitis in children <5 years of age in Oregon and elsewhere. It plummeted in the rankings, and *Streptococcus pneumoniae* is now in the lead. In 2015, Hib was cultured from sterile body fluids of two Oregonians. Both cases were among adults (>48 years). Appropriate use of conjugate vaccine will help ensure Hib infection remains minimal well into the future. All sterile-site *H. influenzae* isolates must be sent to the Oregon State Public Health Laboratory for additional typing.

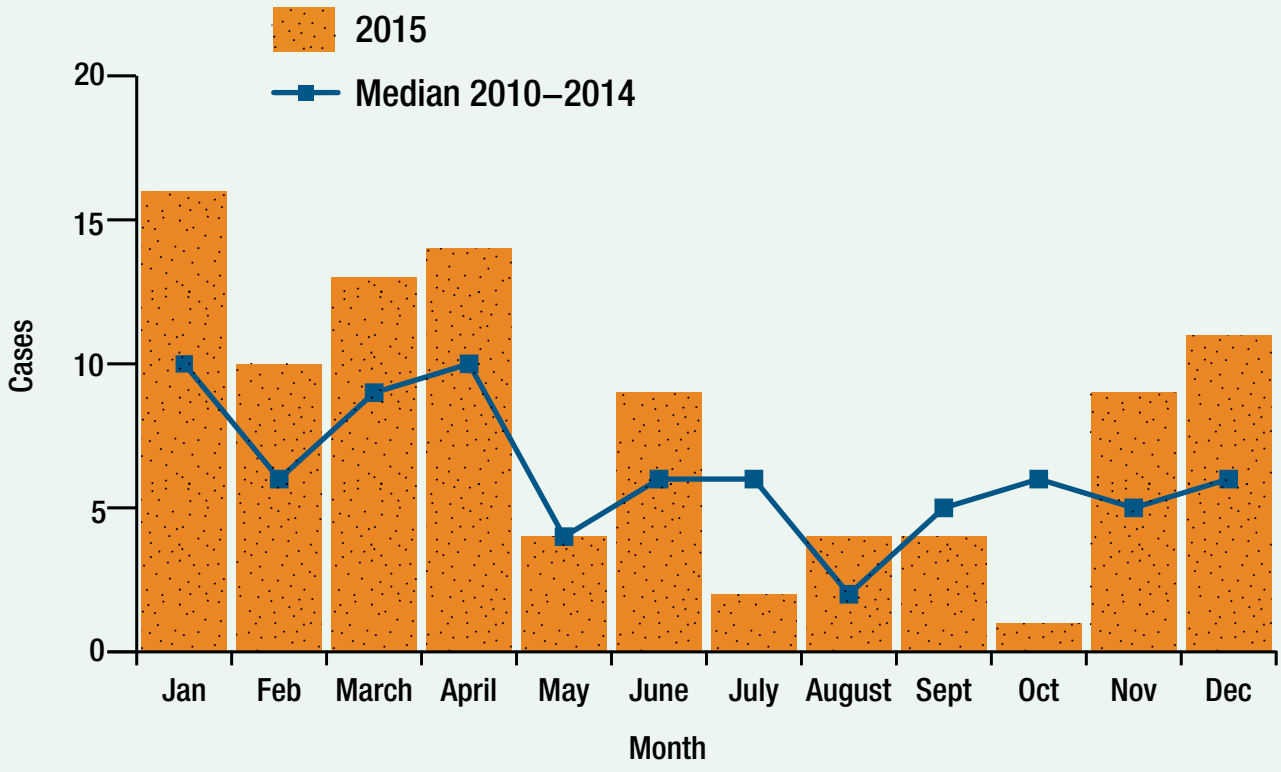
Ninety-seven cases of invasive *H. influenzae* disease (IHiD, all serotypes) were reported in 2015. With the decline in invasive Hib disease in children, there has been increased recognition of nonserotype b and nontypeable cases in persons >5 years of age, especially among those >65 years of age. In 2015, 73% of cases were nontypeable, 10% were identified as serotype f, 8% serotype a, and the remaining cases were other serotypes. The burden of IHiD in 2015 was highest (11.8/100,000 persons) among those >70 years of age, followed by those 50–59 years of age (2.8/100,000 persons) and then those <5 years (2.1/100,000 persons). *Haemophilus influenzae* is treated with antibiotics. In 2015, the top clinical syndrome of invasive IHiD reported in Oregon was pneumonia (59%). Ninety-five percent of cases were hospitalized. There were 18 deaths related to IHiD infection.

Peak incidence tends to occur in late winter and early spring.

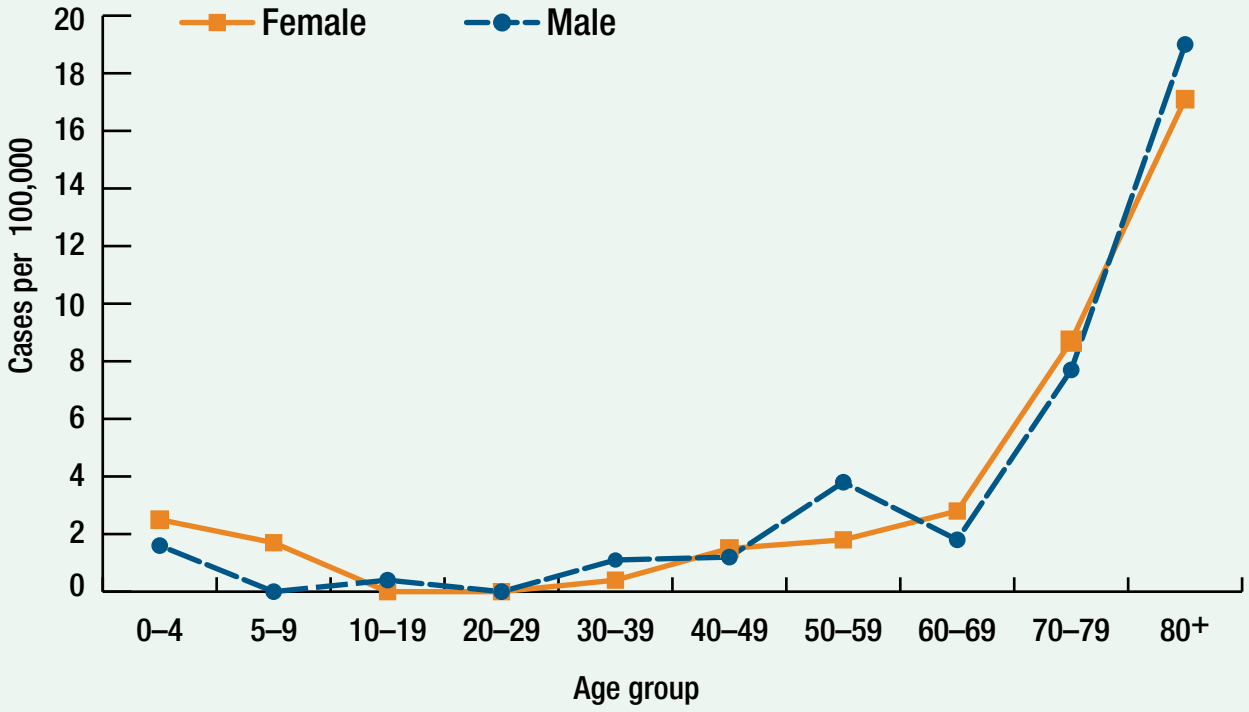
H. influenzae infection by year: Oregon, 1988–2015



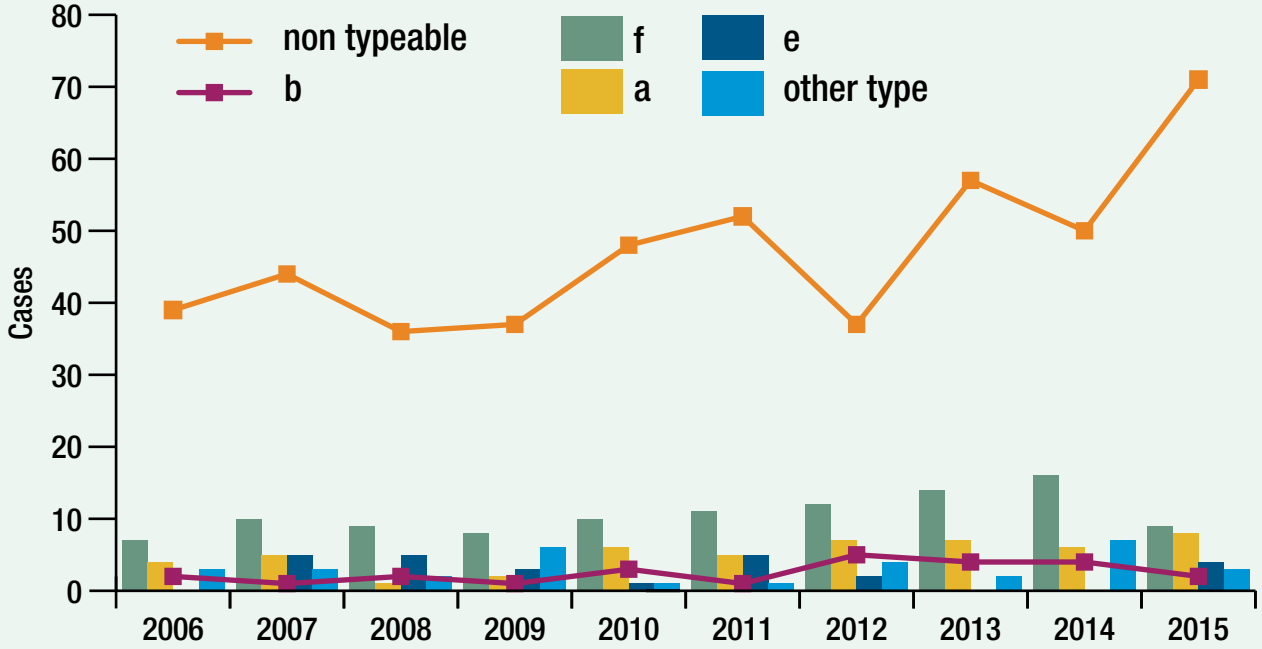
H. influenzae infection by onset month: Oregon, 2015



Incidence of *H. influenzae* infection by age and sex: Oregon, 2015

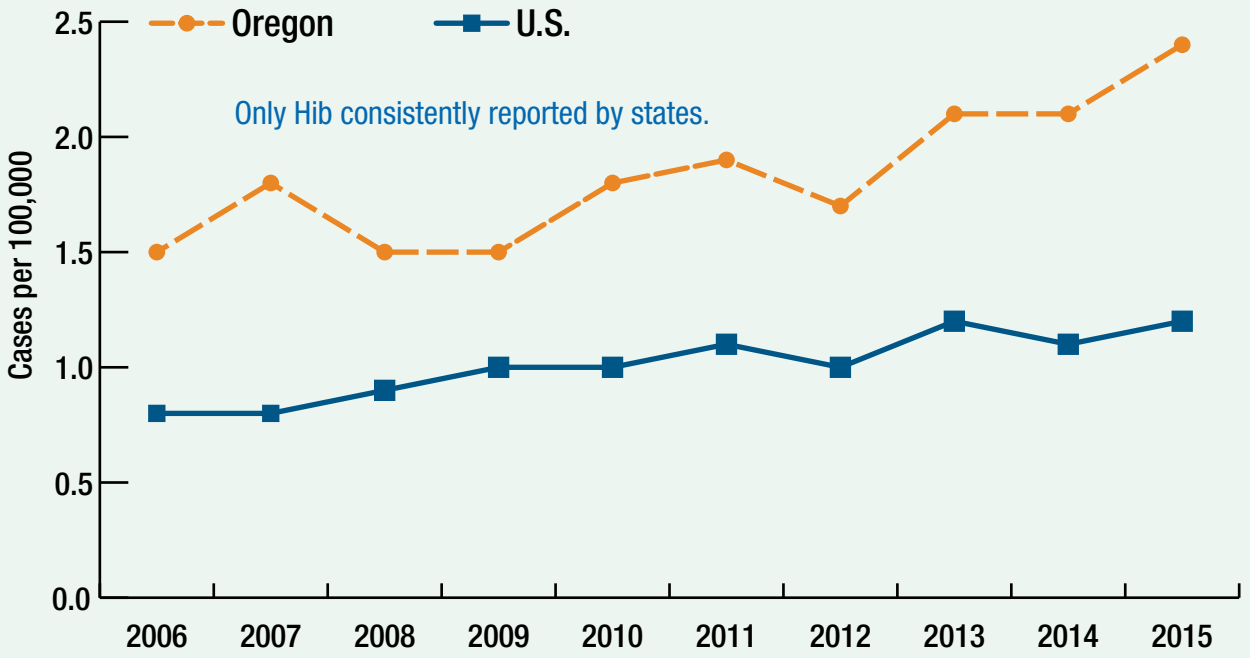


H. influenzae infection by year and serotype: Oregon, 2006–2015



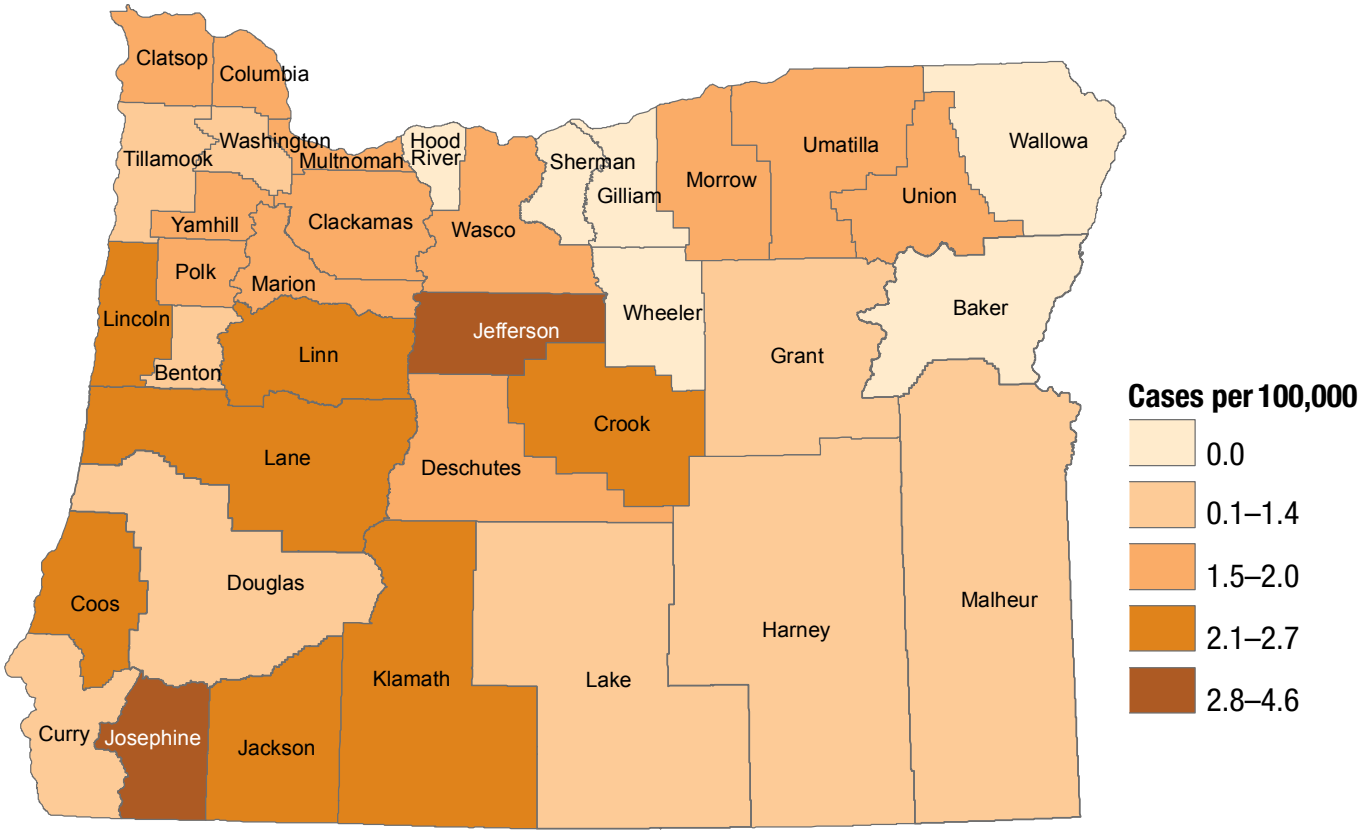
nontypeable	39	44	36	37	48	52	37	57	50	71
b	2	1	2	1	3	1	5	4	4	2
f	7	10	9	8	10	11	12	14	16	9
a	4	5	1	2	6	5	7	7	6	8
e	0	5	5	3	1	5	2	0	0	4
other type	3	3	2	6	1	1	4	2	7	3

Incidence of *H. influenzae* infection: Oregon vs. nationwide, 2006–2015



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	1.5	1.8	1.5	1.5	1.8	1.9	1.7	2.1	2.1	2.4
U.S.	0.8	0.8	0.9	1.0	1.0	1.1	1.0	1.2	1.1	1.2

Incidence of *H. influenzae* infection by county of residence: Oregon, 2006–2015



Prevention

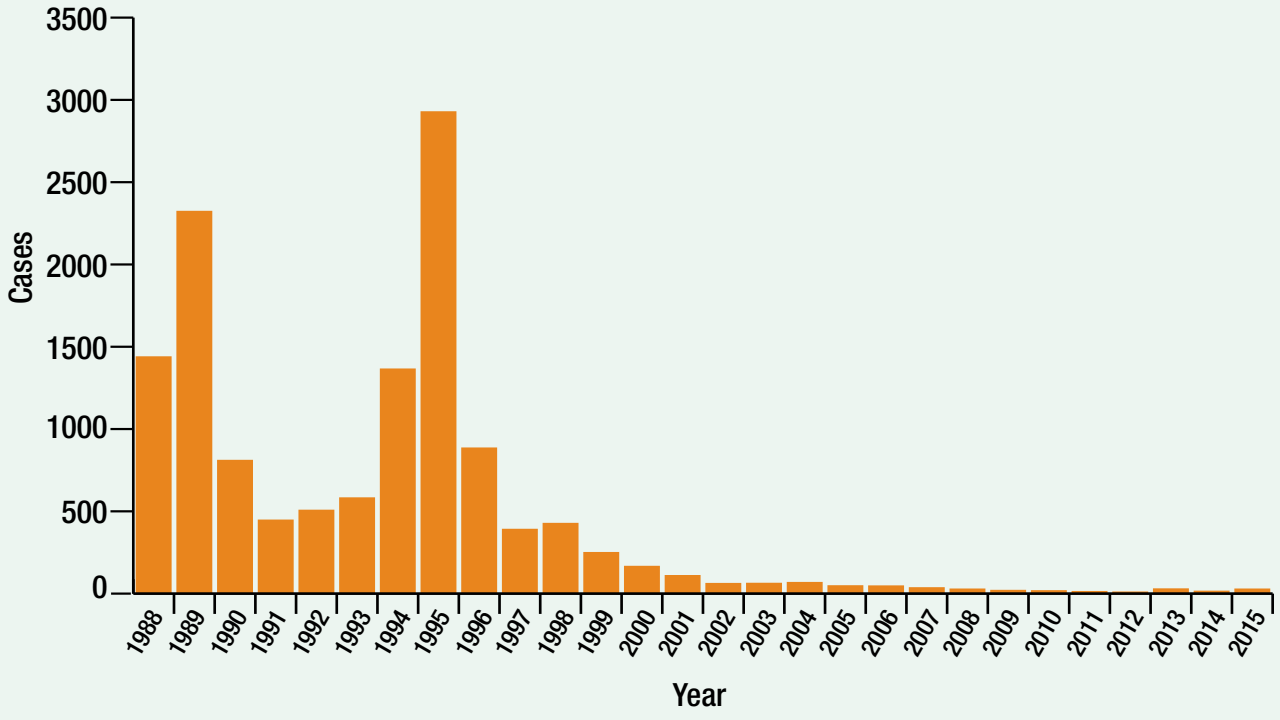
- Vaccinate all children against Hib at 2, 4, 6 and 12–15 months of age.
- Cover your cough and wash your hands.
- Close contacts of Hib cases can be treated prophylactically to prevent infection.

Acute hepatitis A

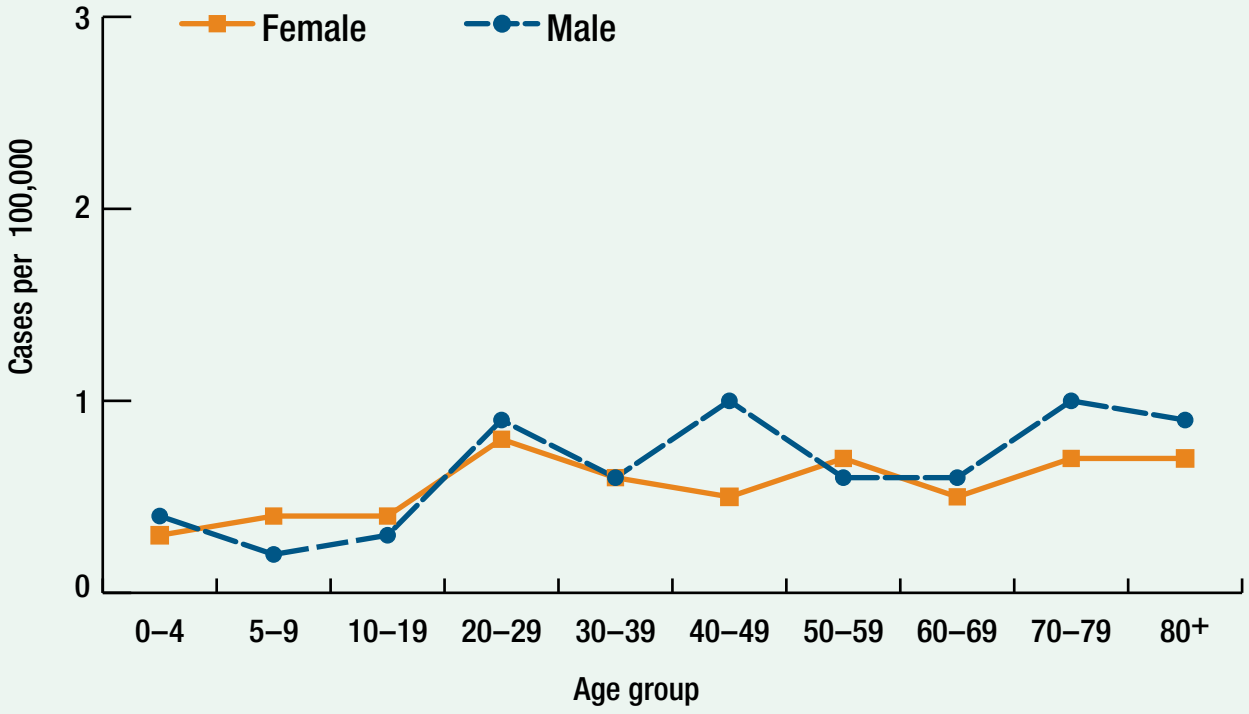
Hepatitis A is a liver disease caused by the hepatitis A virus, which infects humans through fecal-oral transmission. Hepatitis A can occur in situations ranging from isolated cases of disease to statewide outbreaks. However, since the licensure of the hepatitis A vaccine in 1995–1996, rates of infection have declined nationally as well as in Oregon, which had been one of the higher-incidence states. Most cases in Oregon are "sporadic" and occur mainly in persons who travel outside the United States. Oregon has seen small clusters of hepatitis A infections among injection drug users and jail inmates. There were no outbreaks of hepatitis A in Oregon in 2015. The last outbreak of hepatitis A in Oregon occurred in 2006.

In 2015, Oregon logged 27 cases of acute hepatitis A — approximately double the 14 cases reported in the previous year. Eight of the 27 cases were acquired by venturing outside of Oregon or from household members with foreign travel, often to countries with high rates of hepatitis A, such as Mexico, India, Haiti and Indonesia. Fifteen cases had no identifiable risk for factor hepatitis A. Sixty-three percent of cases were >40 years of age.

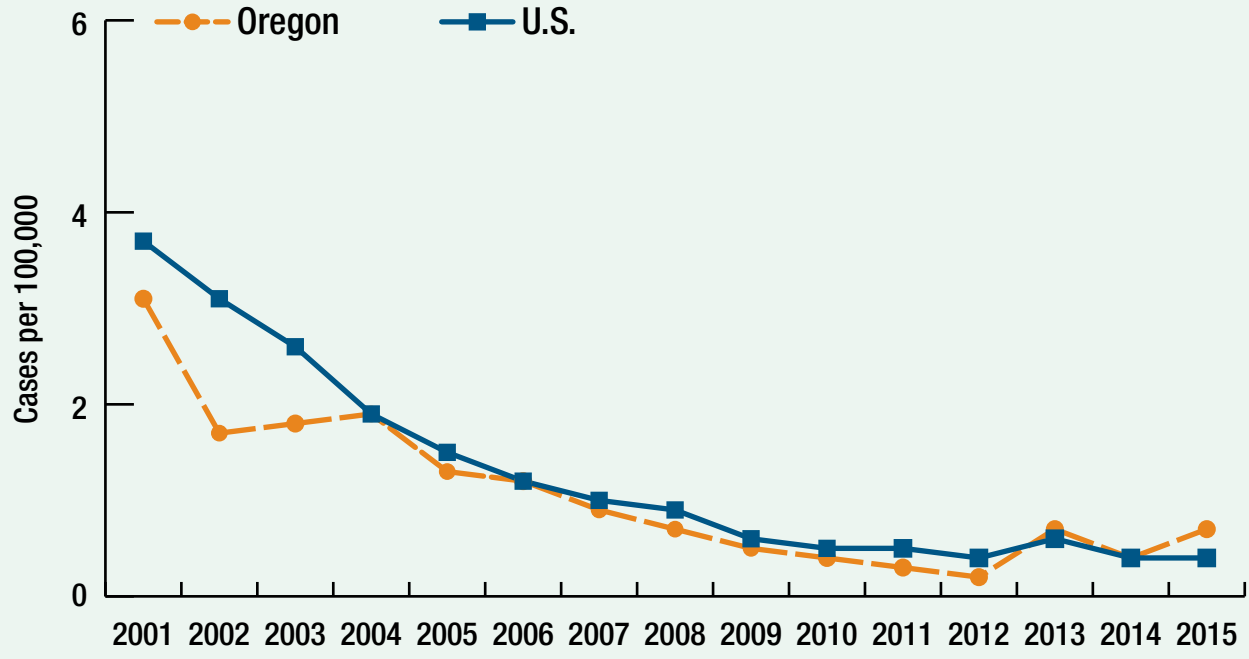
Hepatitis A by year: Oregon, 1988–2015



Incidence of hepatitis A by age and sex: Oregon, 2006–2015

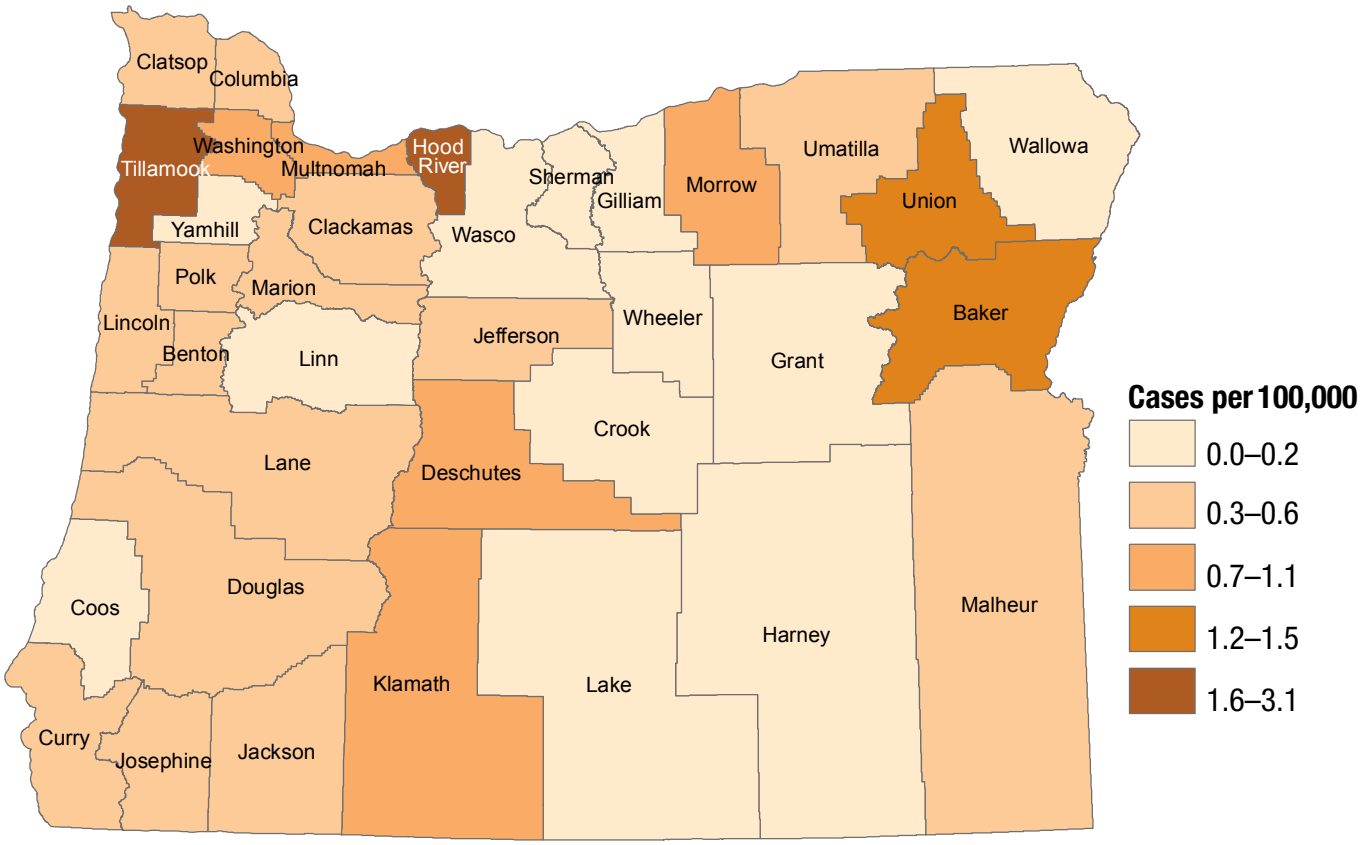


Incidence of hepatitis A: Oregon vs. nationwide, 2001–2015



Oregon	3.1	1.7	1.8	1.9	1.3	1.2	0.9	0.7	0.5	0.4	0.3	0.2	0.7	0.4	0.7
U.S.	3.7	3.1	2.6	1.9	1.5	1.2	1.0	0.9	0.6	0.5	0.5	0.4	0.6	0.4	0.4

Incidence of hepatitis A by county of residence: Oregon, 2006–2015



Prevention

- Vaccinate children >1 year of age against hepatitis A.
- Wash hands with soap and warm water carefully and frequently, especially after going to the bathroom, after changing diapers, and before preparing food or beverages.
- Supervise hand washing of toddlers and small children after they use the toilet.
- Do not work or attend daycare, serve or prepare food, or work in health care while ill with diarrhea.
- Provide post-exposure prophylaxis to close contacts of acute hepatitis cases.

Acute hepatitis B

Hepatitis B is a vaccine-preventable viral disease of the liver that occurs when the virus of an infected person passes (through blood, semen or saliva) into the bloodstream of a non-immune person. Percutaneous or permucosal exposures take place when hypodermic needles are shared, when blood splashes into an eye, during sex, by biting, from lapses in hygiene involving glucometer and other finger stick devices to test blood sugar levels, from breaches in infection control in health care settings, and when a baby is born whose mother is a hepatitis B carrier.

Acute hepatitis B virus (HBV) infection (diagnosed by the presence in serum of IgM antibody to the hepatitis B core antigen [IgM anti-HBc] or hepatitis surface antigen [HBsAg]) usually, but not always, causes jaundice. Some infections are mild, even asymptomatic, and may go undetected. Hepatitis B has been preventable by vaccination since 1982 and, to promote universal vaccination and hence protection, was added to the recommended childhood immunization schedule in 1992 with the series starting at birth.

Acute hepatitis B rates continue to decline in Oregon — a decline that started here after the hepatitis B vaccine was licensed in 1982.

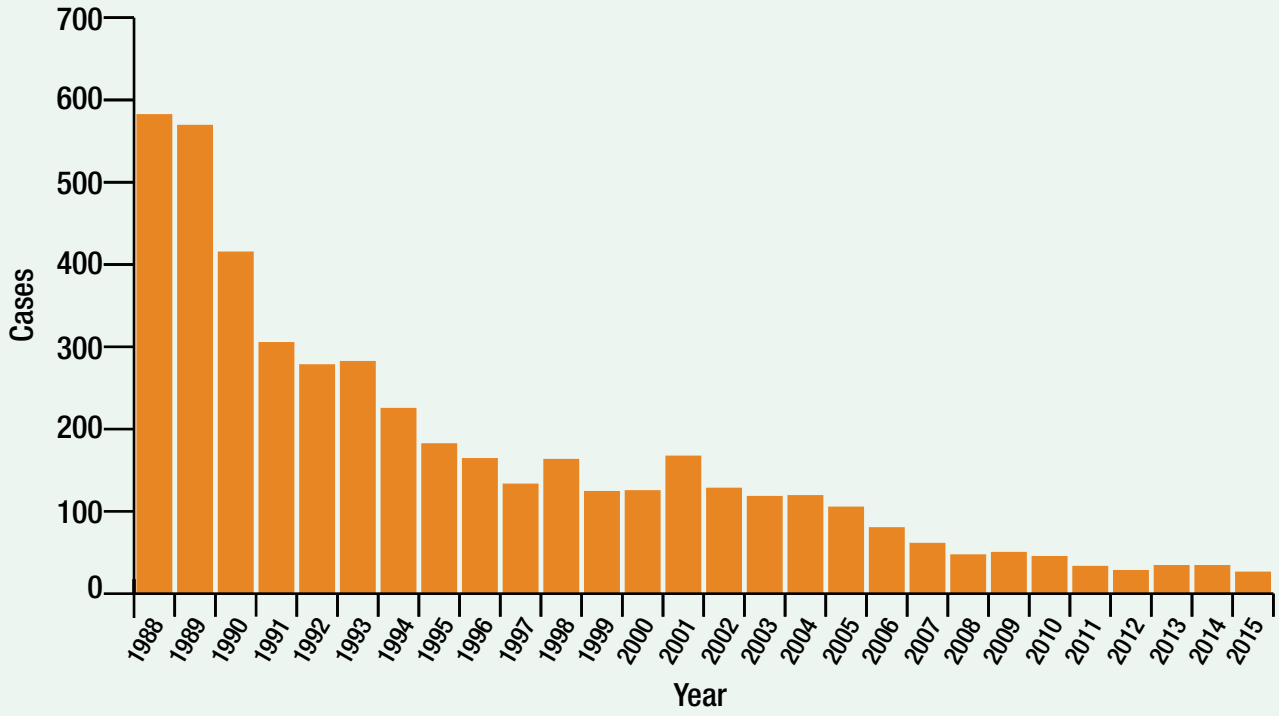
Local health departments investigated and reported 26 acute cases in 2015. Fifty percent of the cases were male. Eighty-five percent were interviewed, the most commonly reported risk factors include ever having an STD, multiple sex partners and health care exposure. No risk factor was identified for 18% of cases. There were no outbreaks of hepatitis B in 2015.

HBV is not spread through food or water, sharing eating utensils, breastfeeding, hugging, kissing, hand holding, coughing or sneezing.

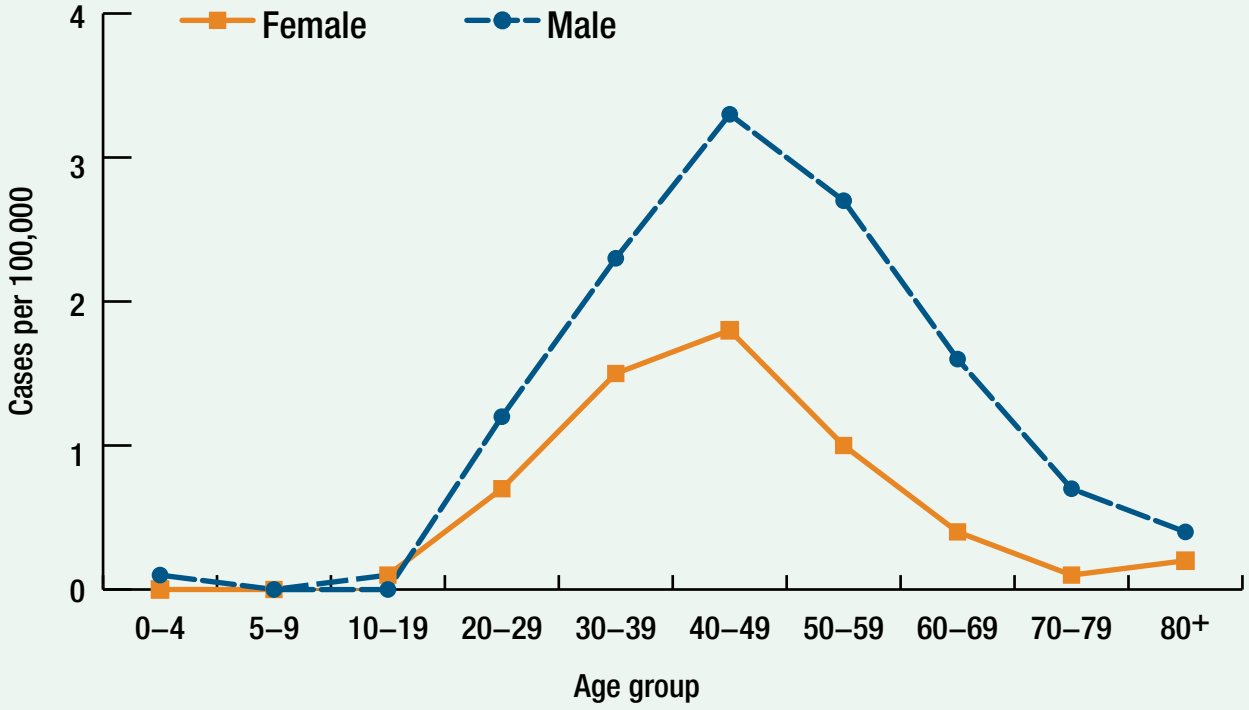
No cure is available for hepatitis B, so prevention is crucial. The best way to be protected from hepatitis B is to be vaccinated. Vaccines can provide protection in 90%–95% of healthy persons. The vaccine can be given safely to infants, children and adults in three doses over a period of six months.

Nationwide, the successful integration of hepatitis B vaccine into the immunization schedule has contributed to a 96% decline in the incidence of acute hepatitis B in children and adolescents. Approximately 95% of new infections occur among adults and unvaccinated adults with behavioral risk factors or who are household contacts or sex partners of HBV-infected people. For this reason the Advisory Committee on Immunization Practices recommends health care providers implement standing orders to identify adults at risk and to administer hepatitis B vaccine as part of routine practice.

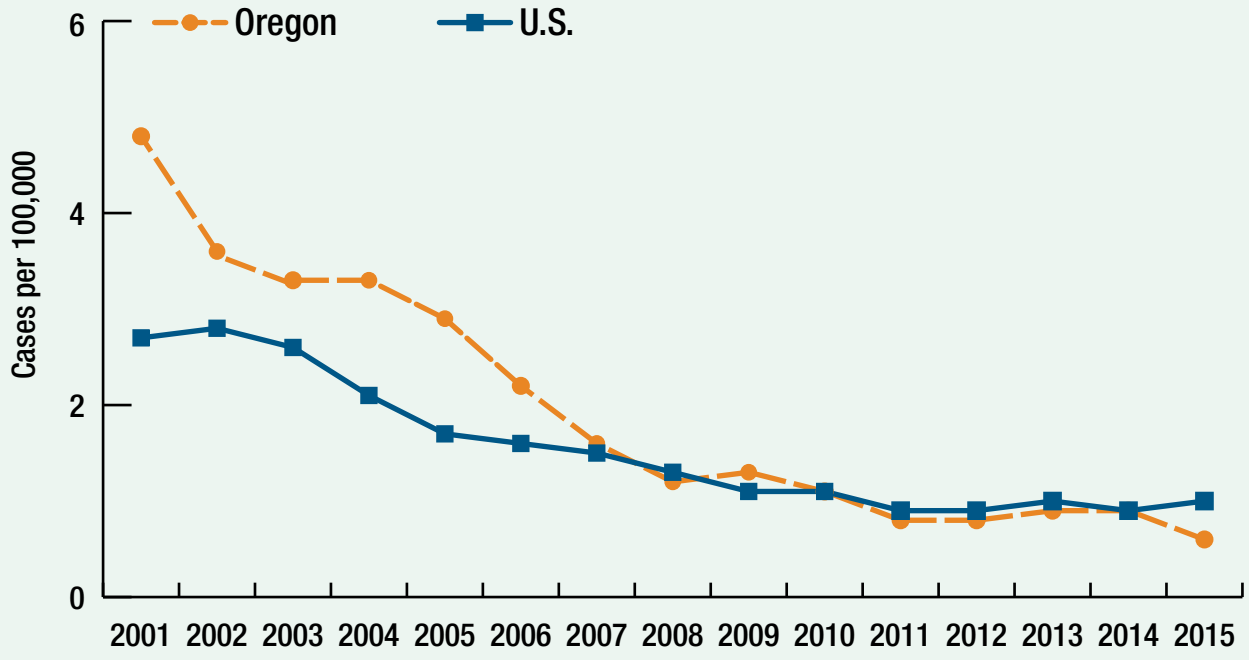
Acute hepatitis B by year: Oregon, 1988–2015



Incidence of acute hepatitis B by age and sex: Oregon, 2006–2015

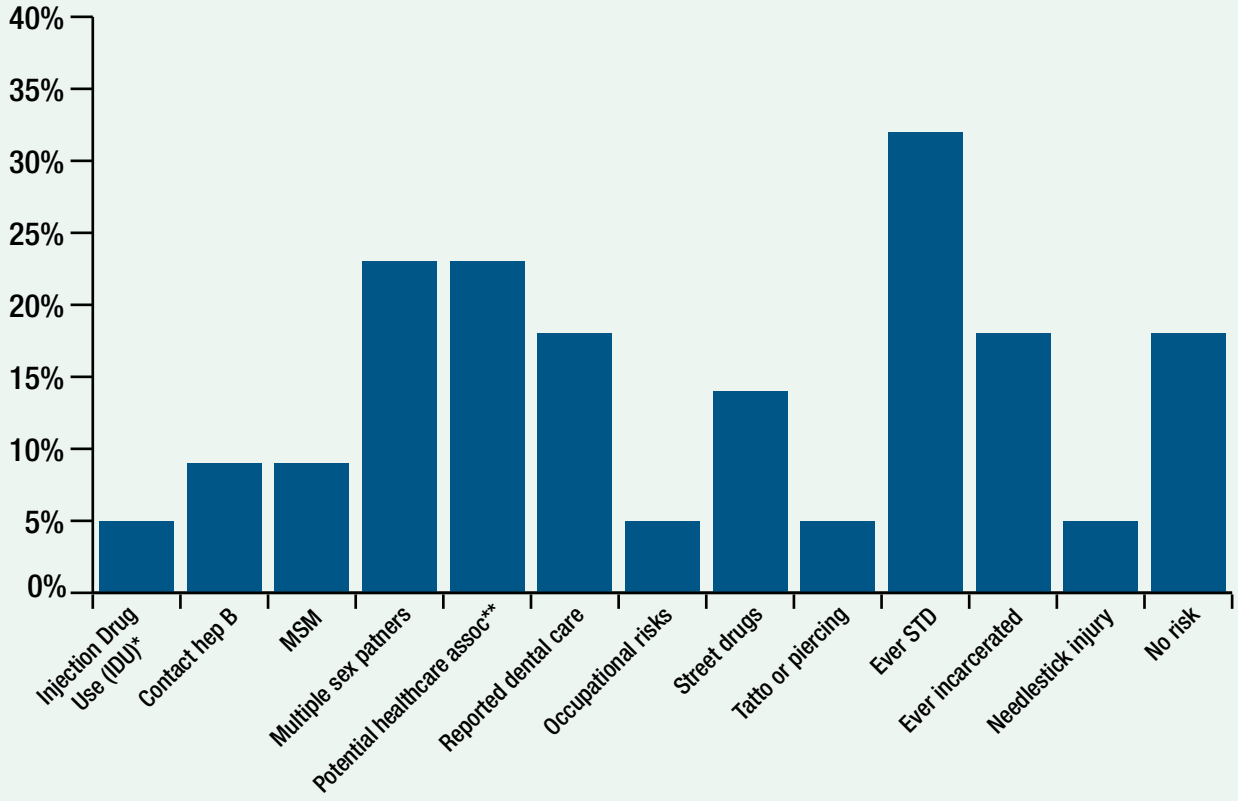


Incidence of acute hepatitis B: Oregon vs. nationwide, 2001–2015



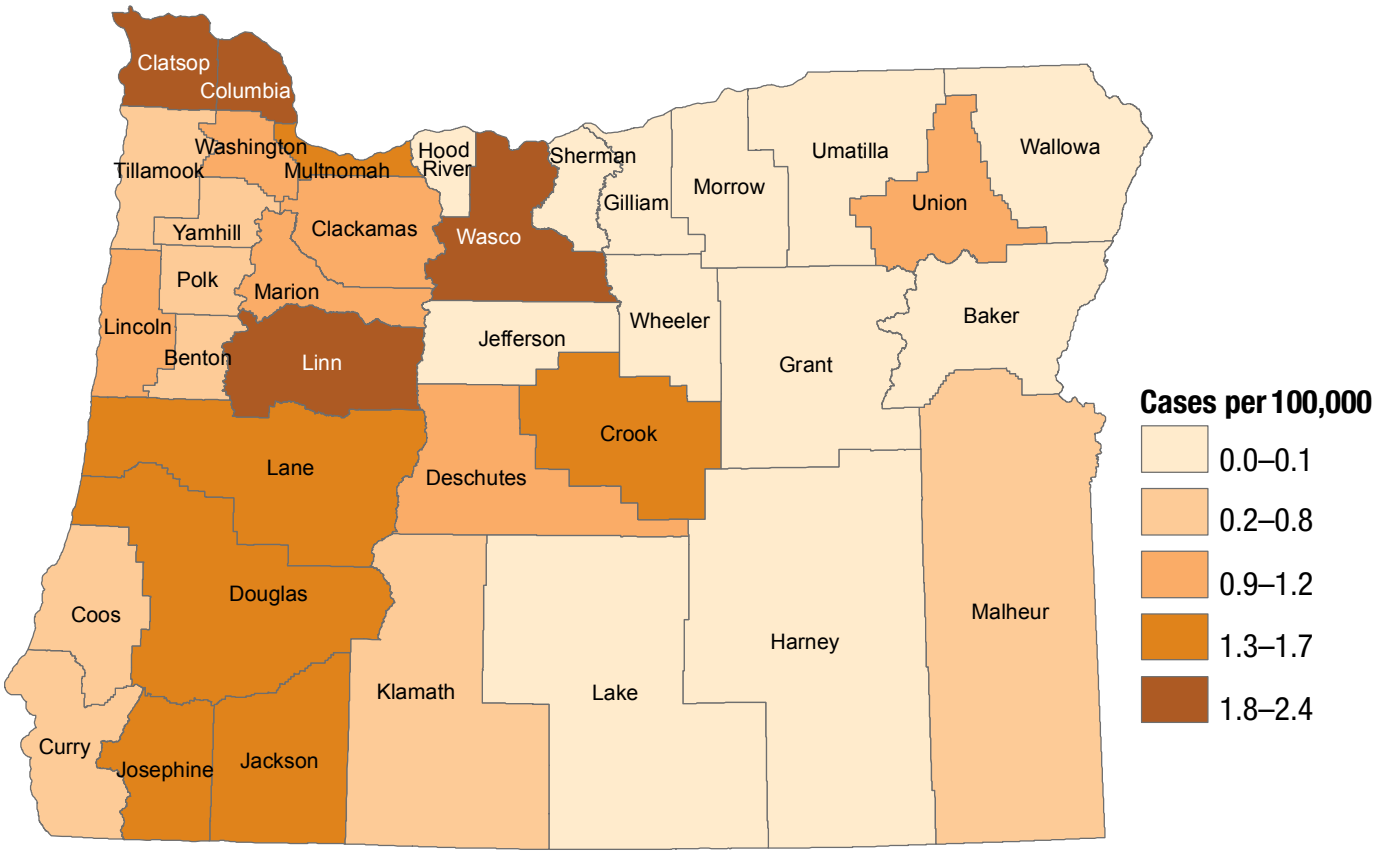
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	4.8	3.6	3.3	3.3	2.9	2.2	1.6	1.2	1.3	1.1	0.8	0.8	0.9	0.9	0.6
U.S.	2.7	2.8	2.6	2.1	1.7	1.6	1.5	1.3	1.1	1.1	0.9	0.9	1.0	0.9	1.0

Reported risk factors for acute hepatitis B among interviewed cases: Oregon, 2015



* IV drug use men who have sex with men
** Transfusion, infusions, dialysis, surgery

Incidence of acute hepatitis B by county of residence: Oregon, 2006–2015



Prevention

- Get vaccinated.
- Persons who are sexually active can:
  - › Limit the number of partners.
  - › Use condoms properly from start to finish when having sex.
- Persons who inject drugs can:
  - › Avoid sharing needles or works with others.
  - › Use only clean needles and works.
  - › Purchase new, sterile needles from pharmacies.
  - › Use universal precautions and best practices to prevent needlestick injuries.
- Vaccinate all newborns against hepatitis B.
- Screen all pregnant women for hepatitis B. Infants born to hepatitis B-positive mothers should receive hepatitis immunoglobulin along with vaccine at birth.
- Chronic carriers should not share personal care items such as razors or toothbrushes.

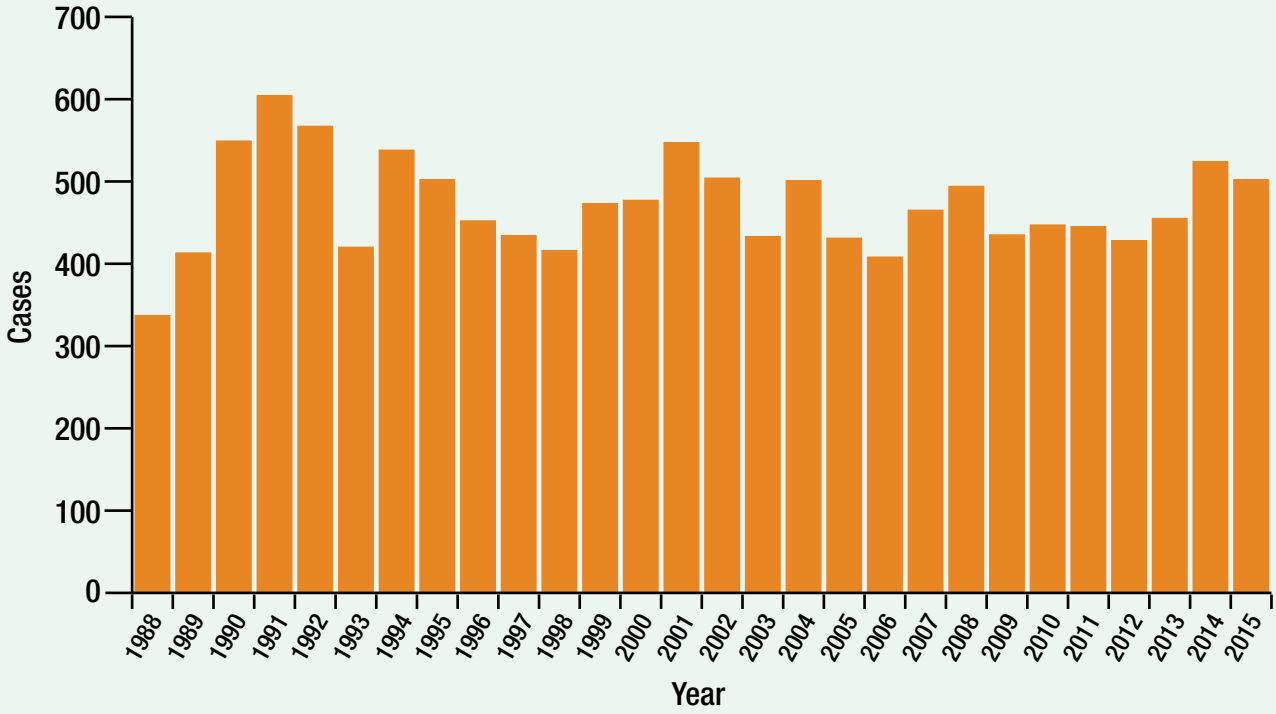
Chronic hepatitis B

Persons with chronic hepatitis B are known as "chronic carriers" — a state of infection defined by the persistence of hepatitis B surface antigen (HBsAg) in the blood for more than six months. The likelihood of becoming a chronic carrier varies by age at infection. Fewer than 6% of acutely infected adults in the U.S. become carriers, compared to 25% (with HBeAg-negative moms) to 90% (with HBeAg-positive moms) of children infected in early childhood or during birth. Perinatal infection can be prevented by prompt administration of hepatitis B immune globulin and initiation of the three-dose hepatitis B vaccination series. This perinatal intervention is widely practiced in the U.S. — all states have federal funding for perinatal hepatitis B prevention programs — but not in other parts of the world, particularly Asia and sub-Saharan Africa, where the prevalence of chronic hepatitis B is higher to begin with. Chronic carriers are at greater risk of developing life-threatening diseases (e.g., chronic active hepatitis, cirrhosis or liver cancer) decades later. Carriers will continue to transmit hepatitis B until vaccine-induced immunity is nearly universal.

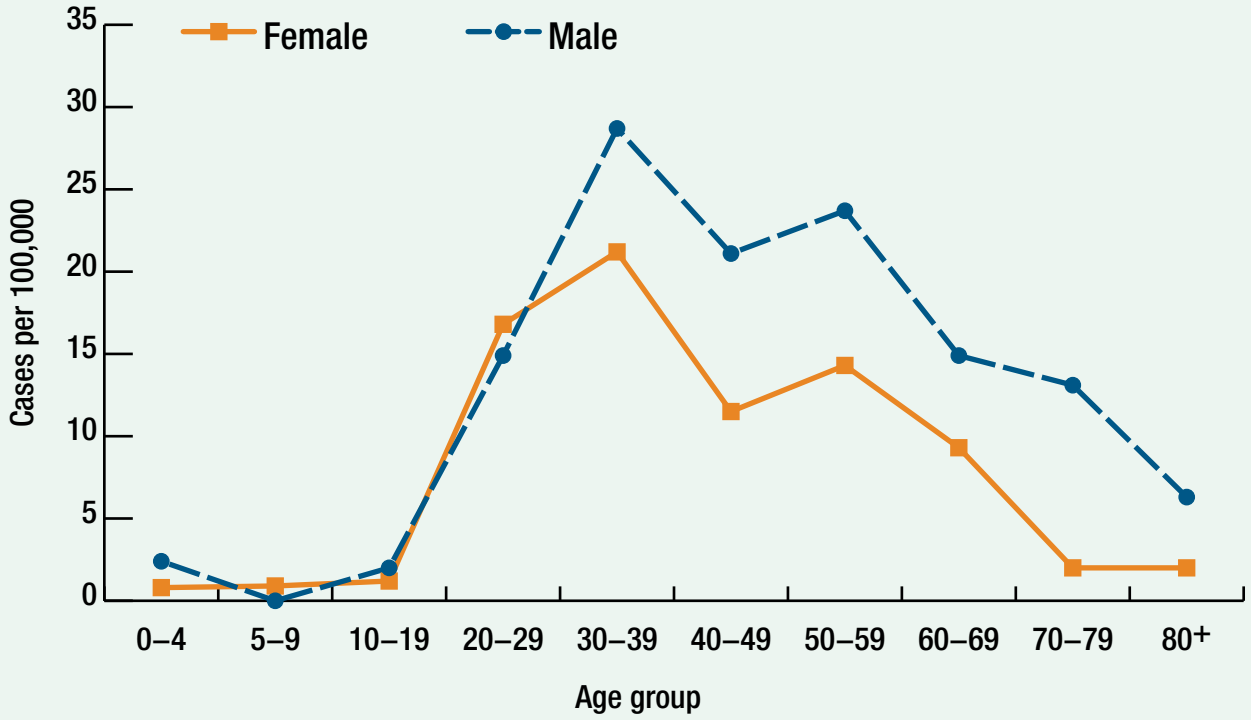
Recommendations and strategies to prevent new cases include the following: routinely vaccinating all infants at birth, screening all pregnant women for hepatitis B, administering hepatitis B immune globulin (HBIG) in addition to hepatitis B vaccine to infants born to HBsAg-positive mothers, and ensuring all infants complete the hepatitis B vaccine series. When given within 24 hours of birth, HBIG and vaccine are 85%–95% effective in preventing hepatitis B disease in children born to HBV-infected mothers. Despite receiving the recommended case management, one case of perinatal hepatitis B was identified in Oregon in 2015.

In 2015, there were 502 newly reported carriers in Oregon, slightly less than the 524 reported in 2014. Forty-two percent of these were women who tend to be diagnosed earlier than men, perhaps due to prenatal screening. Chronic carriers are not reportable in many states, so a table comparing Oregon to the rest of the U.S. is not provided.

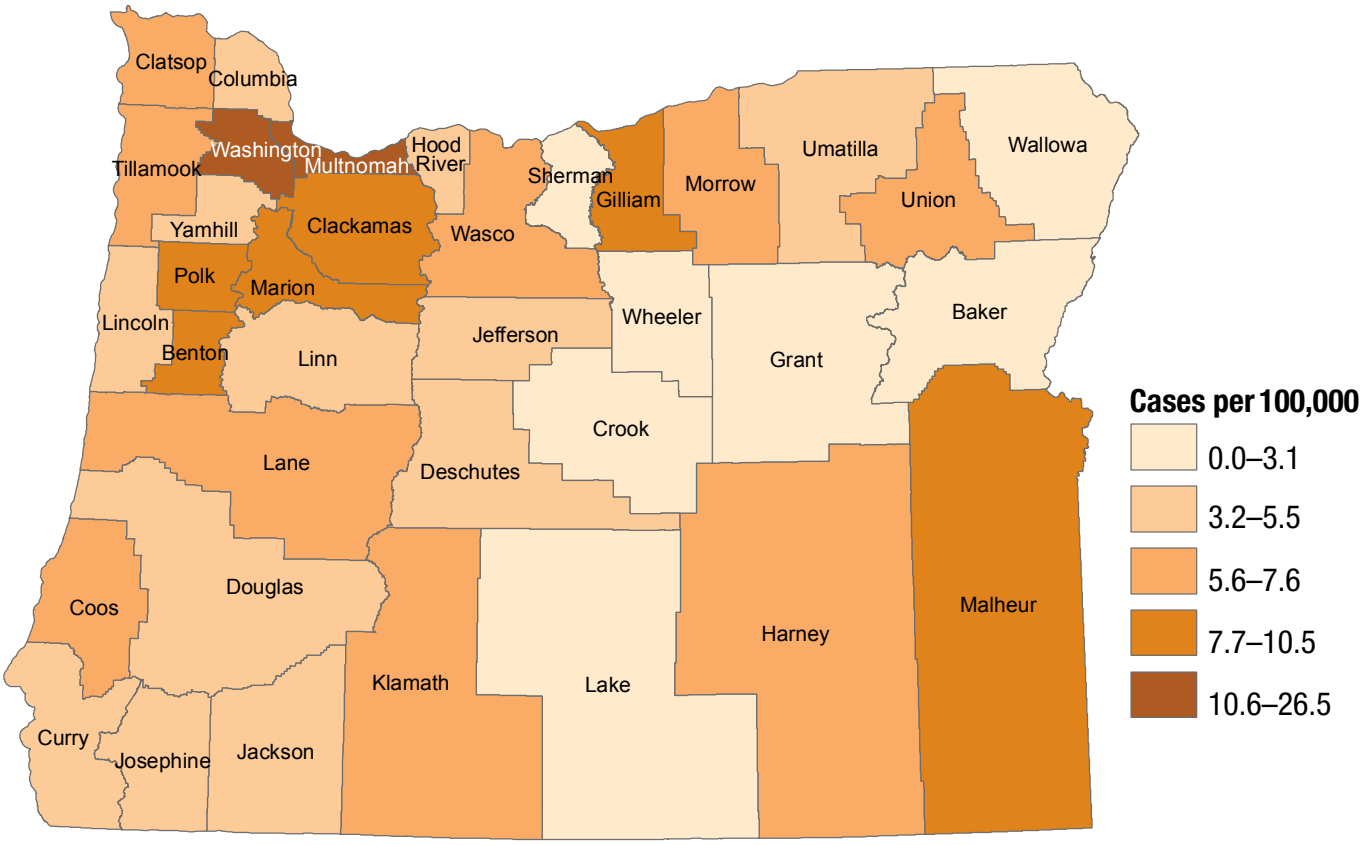
Newly reported chronic hepatitis B by year: Oregon, 1988–2015



Incidence of chronic hepatitis B by age and sex: Oregon, 2015



Incidence of newly reported chronic hepatitis B by county of residence: Oregon, 2006–2015



Prevention

- Get vaccinated.
- Persons who are sexually active can:
  - › Limit the number of partners.
  - › Use condoms properly from start to finish when having sex.
- Persons who inject drugs can:
  - › Avoid sharing needles or works with others.
  - › Use only clean needles and works.
  - › Purchase new sterile needles from pharmacies.
- Use universal precautions and best practices to prevent needlestick injuries.
- Vaccinate all newborns against hepatitis B.
- Screen all pregnant women for hepatitis B. Infants born to hepatitis B-positive mothers should receive hepatitis immunoglobulin along with vaccine at birth.
- Chronic carriers should not share personal care items such as razors or toothbrushes.
- Investigation of cases, including the identification of unvaccinated contacts to encourage vaccination.

Hepatitis C

Hepatitis C virus (HCV) is a bloodborne infection that may cause both acute and chronic hepatitis C. The most common signs and symptoms of acute hepatitis C include jaundice, fatigue, dark urine, abdominal pain, loss of appetite and nausea. Acute hepatitis C cases are underreported because 80% are asymptomatic, and laboratories cannot distinguish between acute and chronic HCV infection. Chronic hepatitis C can lead to liver damage and sometimes death due to cirrhosis and liver cancer. In the U. S., an estimated 2.7–3.9 million people are infected with HCV. Chronic liver disease develops in up to 70% of chronically infected persons, and hepatitis C is the leading indication for liver transplant. Analysis of U.S. mortality data shows a steady increase in deaths from HCV over the last 15 years, reaching 19,659 deaths in 2014. Factors associated with HCV-related deaths included chronic liver disease, HBV co-infection, alcohol related conditions, minority status and HIV co-infection. Mirroring national trends, deaths from HCV in Oregon have risen steadily over the last decade, averaging more 500 deaths annually in Oregon during the last five years. Oregon's HCV mortality rate during 2009–2013 is more than six times higher than Oregon's HIV mortality rate. HCV mortality is also higher in Oregon than in the U.S. as a whole. In 2014, the most recent year national data are available, the age-adjusted Oregon mortality rate was 10.8 deaths per 100,000 persons, compared to the national mortality rate of 5.0 deaths per 100,000.

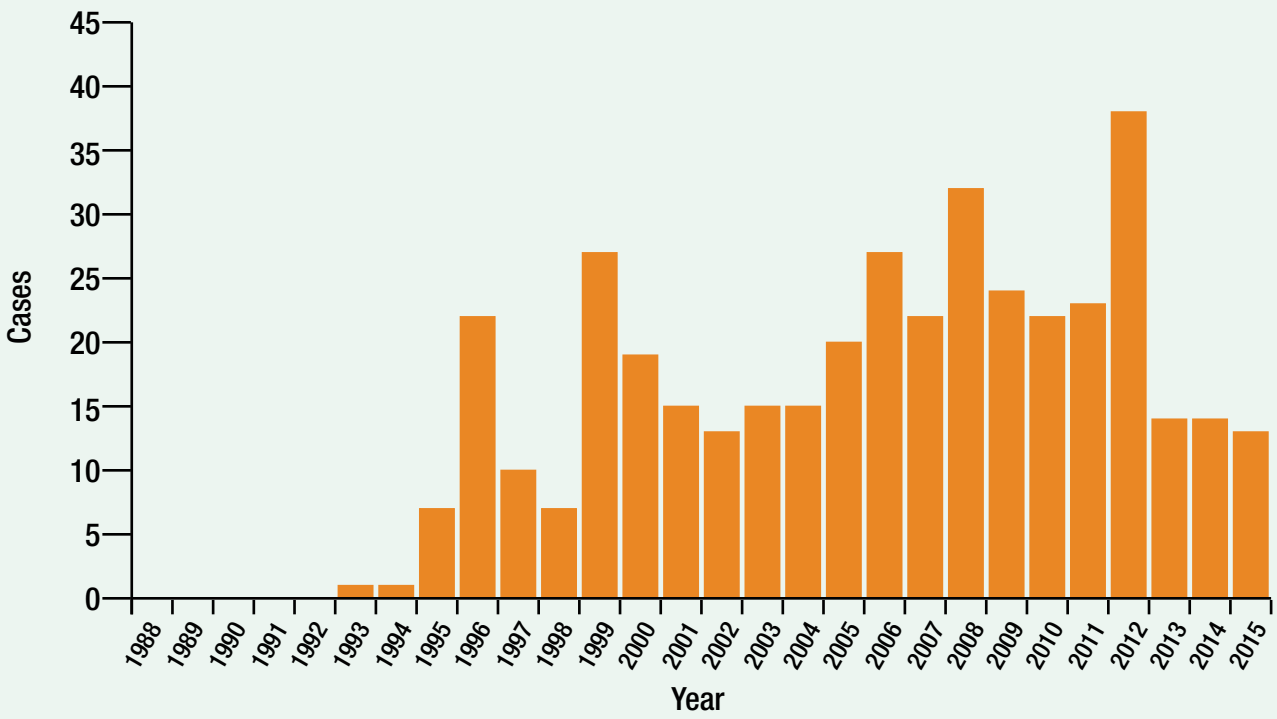
There is no vaccine for hepatitis C.

Hepatitis C is spread from one person to another primarily by percutaneous exposure to human blood; most infections are due to illegal injection drug use. Uncommonly, the virus can also be transmitted through sexual contact and from infected mothers to their infants at the time of birth. The risk for perinatal HCV transmission is approximately 4%. If the mother is co-infected with HIV, the risk for perinatal infection increases to approximately 19%. Since the adoption of routine blood donor screening in 1992, HCV is transmitted less than one time for every 2 million units of blood transfused. Cases can occur in health care settings, most commonly related to improper reuse of syringes or multidose vials.

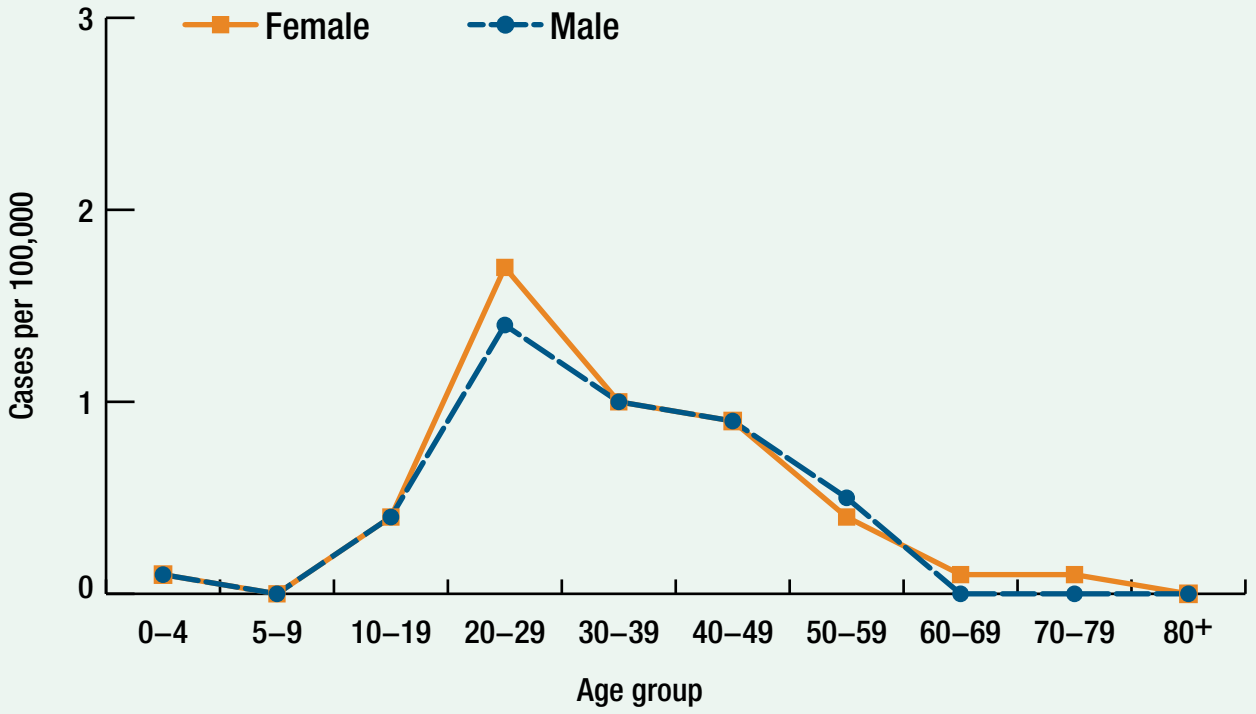
Acute hepatitis C

On average during 2005–2015, there were 23 acute hepatitis C cases reported annually in Oregon. In 2015, 13 cases were reported. Nine (69%) of the cases were <40 years of age, and 8 (62%) were female. Injection drug use remains the predominant risk factor reported by cases (75%). There were no health care-associated acute hepatitis C cases in 2015. Currently there is no vaccine for hepatitis C.

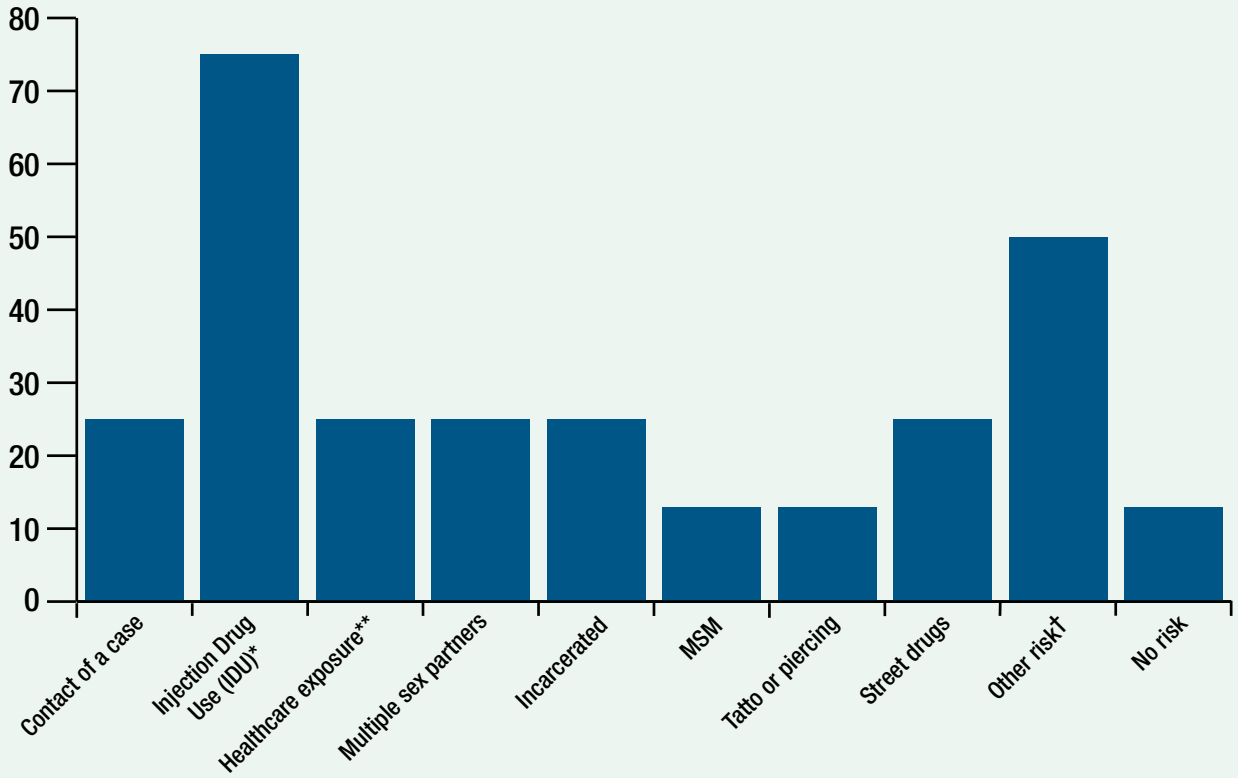
Acute hepatitis C by year: Oregon, 1988–2015



Acute hepatitis C by age and sex: Oregon, 2006–2015

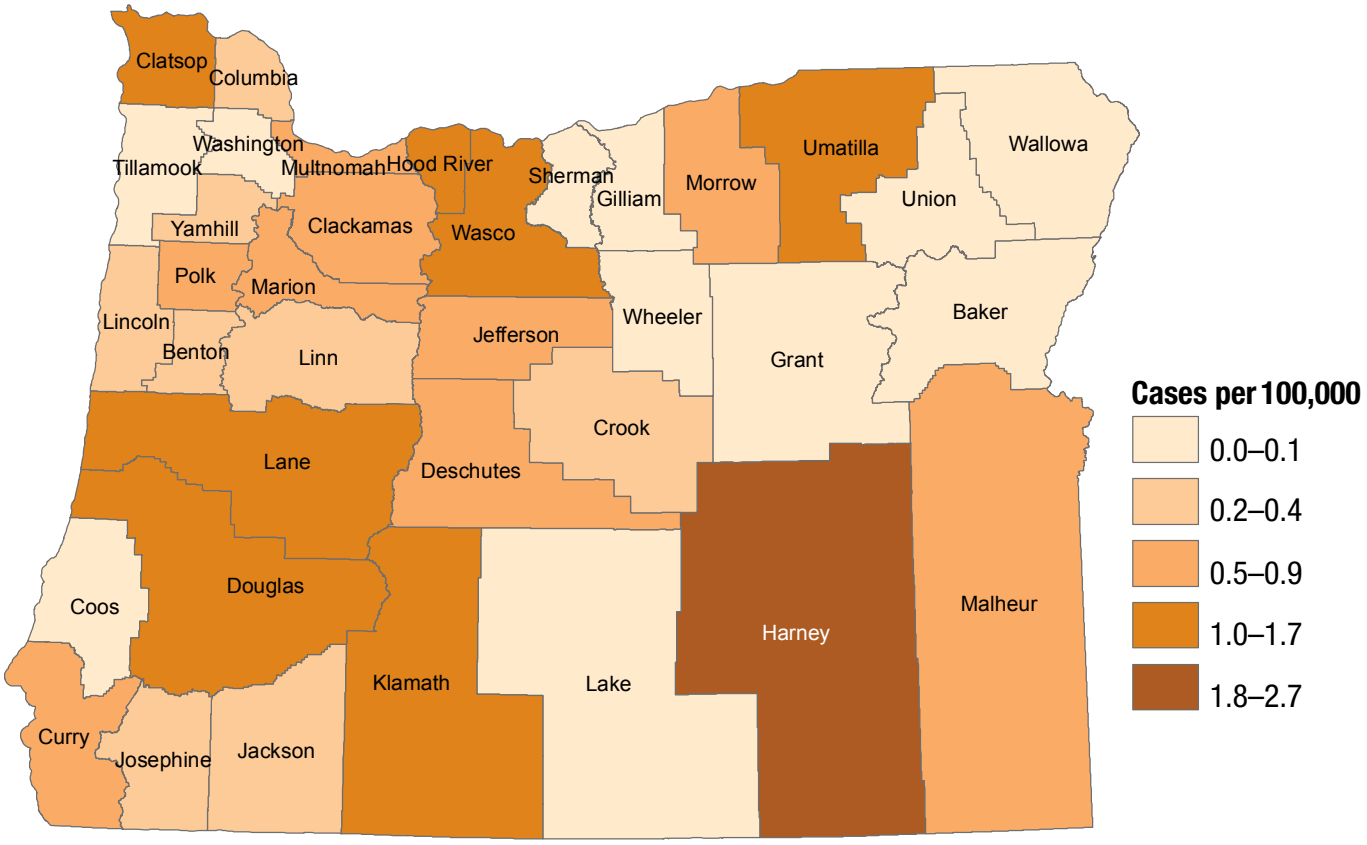


Reported risk factors for acute hepatitis C among interviewed cases: Oregon, 2015



*IV drug use men who have sex with men
**Transfusion, infusions, dialysis, surgery, dental work
†Needlestick, other blood exposure

Incidence of acute hepatitis C by county of residence: Oregon, 2006–2015



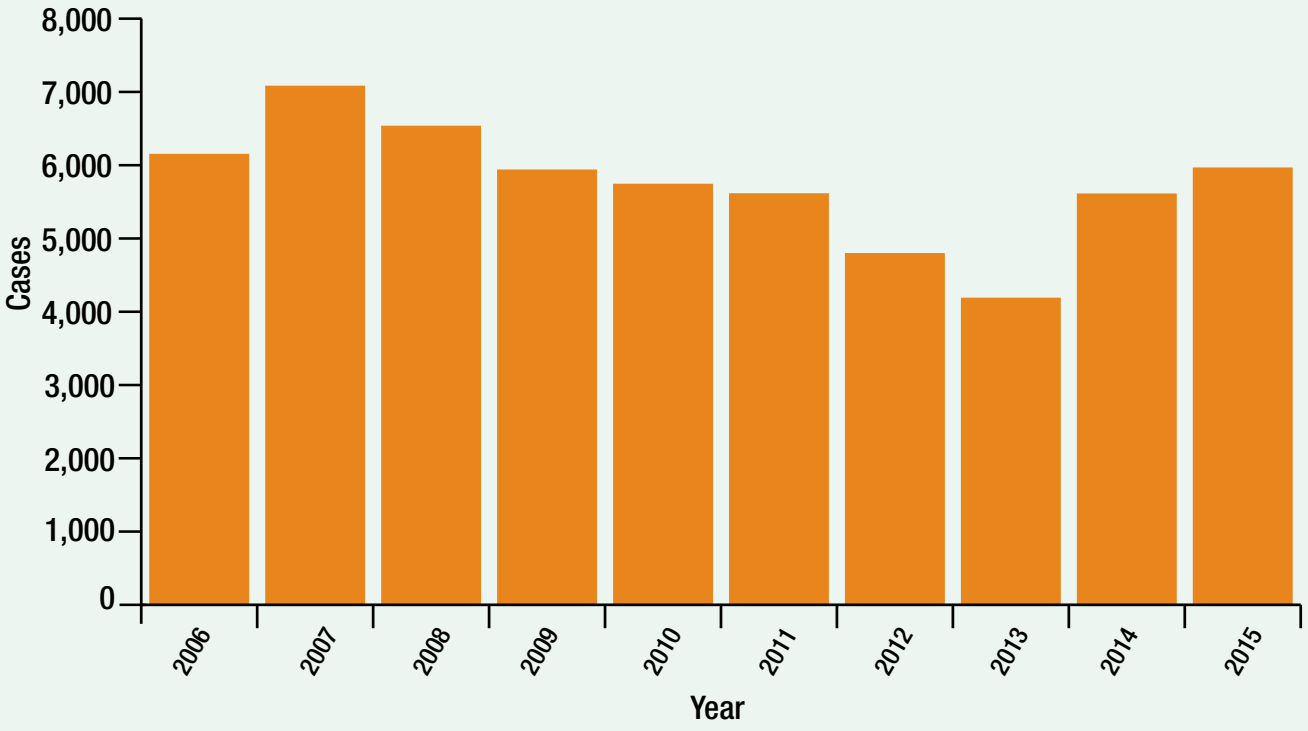
Prevention

- Health care workers: use universal precautions and best practices to prevent needlestick injuries.
- Persons who inject drugs can:
  - › Avoid sharing needles or works with others.
  - › Use only clean needles and works.
  - › Purchase new sterile needles from pharmacies.

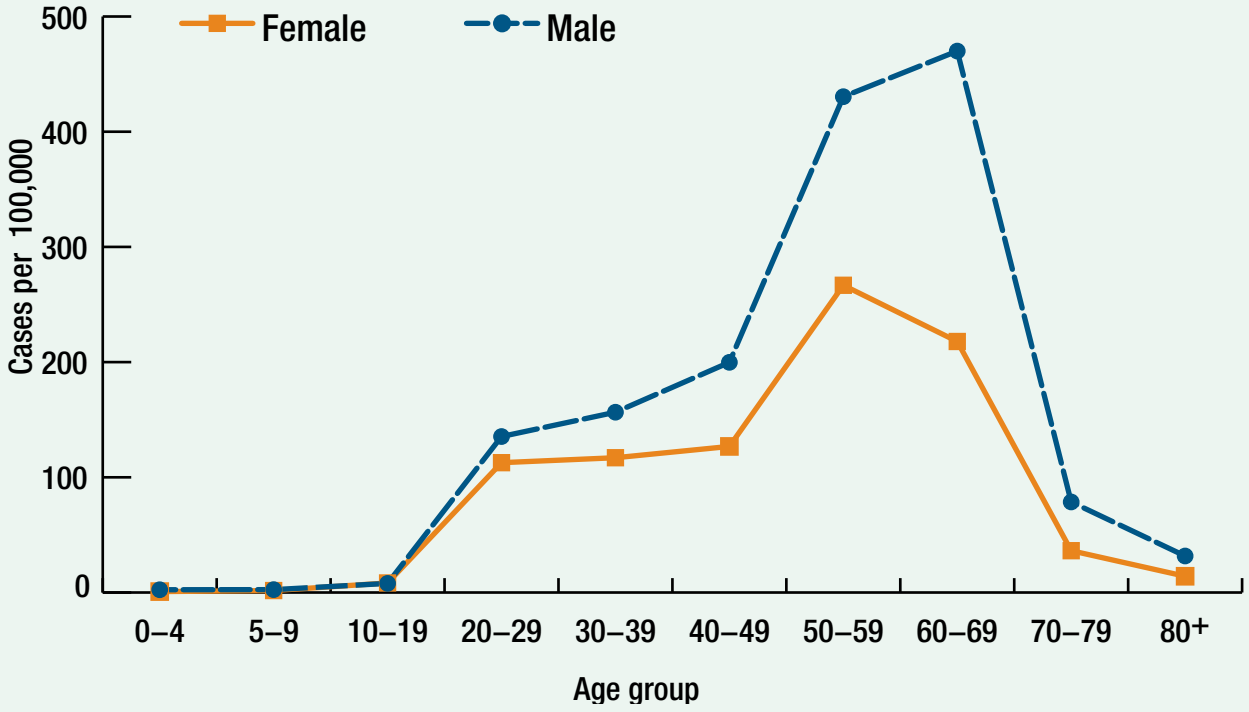
Chronic hepatitis C

Chronic hepatitis C became reportable in Oregon as of July 1, 2005. In 2015, 5,960 chronic hepatitis C cases were reported, up slightly from 5,605 reported in 2014. These numbers are likely an underestimate of the true incidence because most infections are asymptomatic and therefore not diagnosed or reported to public health. Infection in males (184/100,000) is more common than in females (113/100,000). The highest prevalence of HCV infection is among persons born between 1945–1965. CDC estimates this age group comprises 75% of chronic hepatitis C cases in the U.S.; among 2015 Oregon cases, 568 belong to this age group.

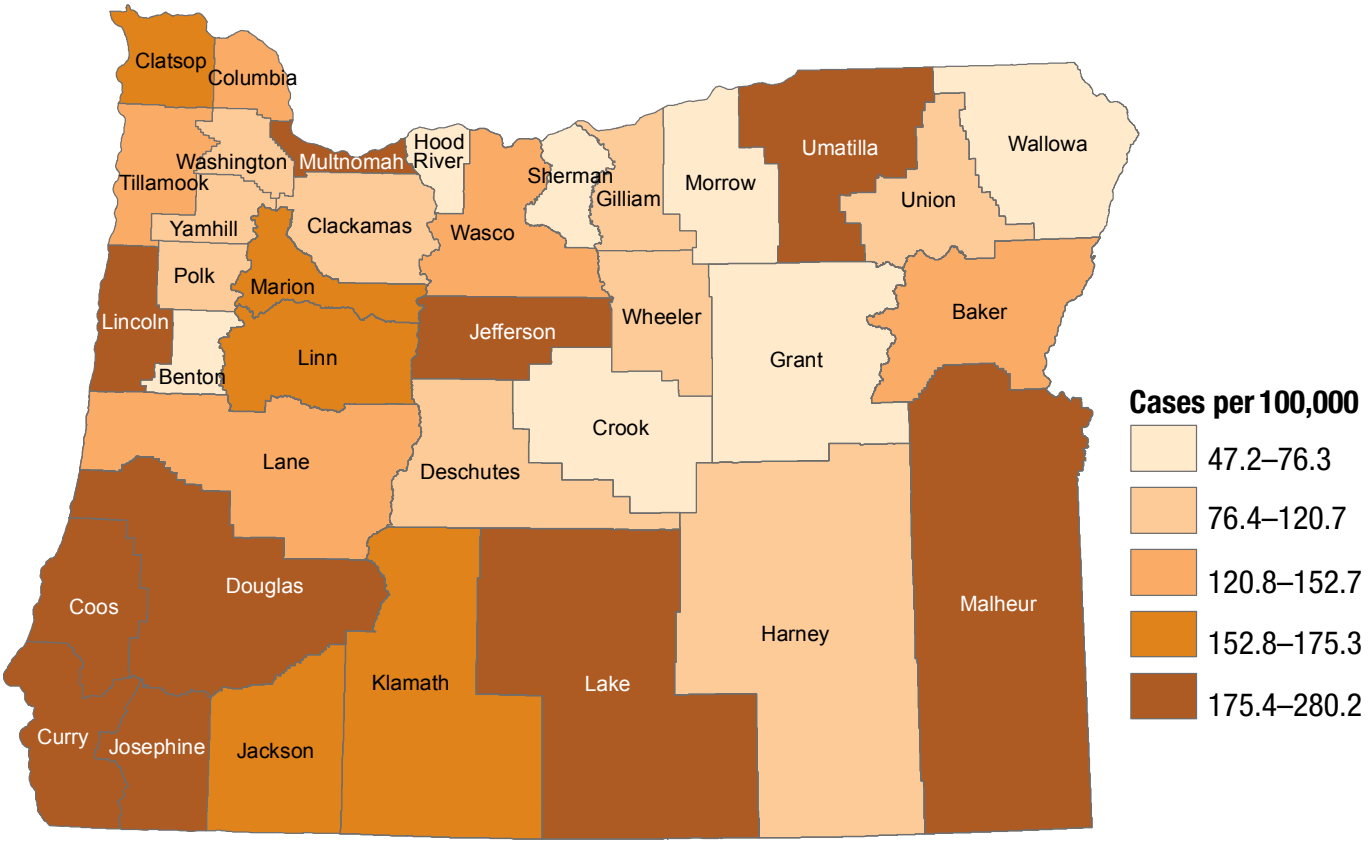
Chronic hepatitis C by year: Oregon, 2006–2015



Incidence of chronic hepatitis C by age and sex: Oregon, 2015



Incidence of chronic hepatitis C by county of residence: Oregon, 2006–2015



Prevention

- Health care workers: use universal precautions and best practices to prevent needlestick injuries.
- Persons who inject drugs can:
  - › Avoid sharing needles or works with others.
  - › Use only clean needles and works.
  - › Purchase new sterile needles from pharmacies.

Legionellosis

Legionellosis is usually an acute respiratory tract infection that begins two to 14 days after exposure to *Legionella* spp. Signs of the disease can include a high fever, chills and cough, in addition to headache and muscle aches. Symptoms are similar to those seen in other forms of pneumonia, so the diagnosis is rarely obvious and can be difficult to make. Available confirmatory diagnostic tests include urine antigen detection, direct fluorescent antibody staining and culture.

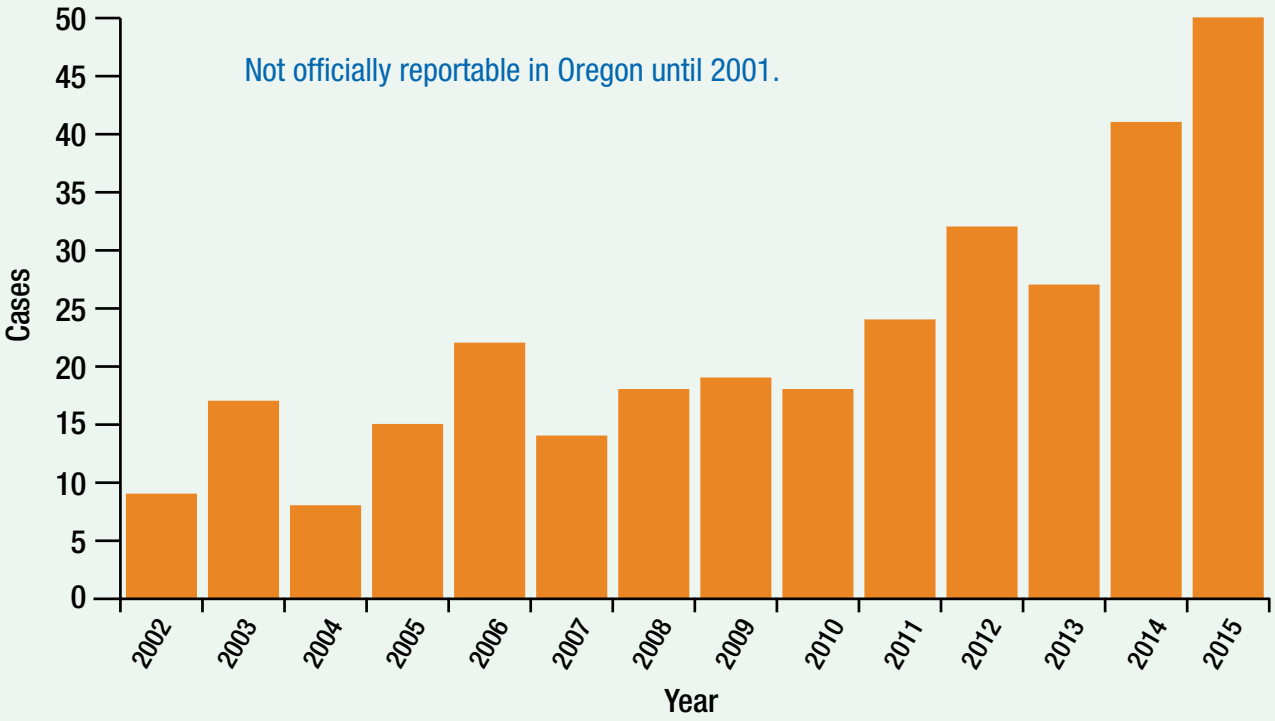
"Pontiac fever," a milder illness associated with *Legionella* bacteria, is characterized by fever and muscle aches without pneumonia. It typically occurs a few hours to two days after exposure.

Legionella bacteria are found naturally in the environment, usually in water, and grow best in warm conditions such as hot tubs, cooling towers, hot-water tanks, large plumbing systems or the air-conditioning systems of large buildings. They are transmitted by inhalation of aerosolized water or soil infected with the bacteria. Person-to-person transmission does not occur.

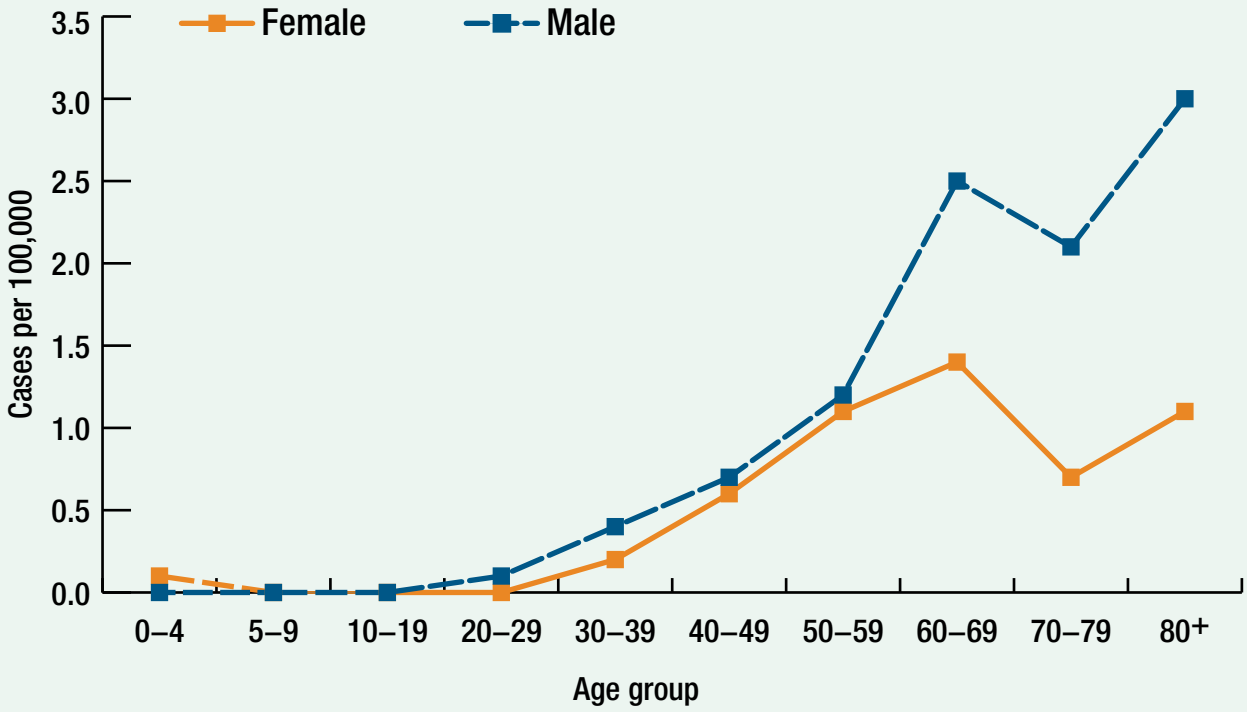
Risks for infection include older age, smoking, chronic lung disease (e.g., emphysema), renal insufficiency, diabetes and immune deficiency. Death occurs in 10–15% of cases; a substantially higher proportion of fatal cases occur during outbreaks in hospitals or other health care facilities. Infections are treated with antibiotics.

Legionellosis became officially reportable in Oregon in 2001. In 2015, 50 cases of legionellosis were reported among Oregonians; all but two cases were hospitalized. There were five deaths. The incidence of reported cases has more than quadrupled during 2002–2015, from 0.3 per 100,000 persons to 1.2. While reasons for this increase are unknown, increases in older persons, persons at high risk for infection, and increased case detection and reporting may have played a role.

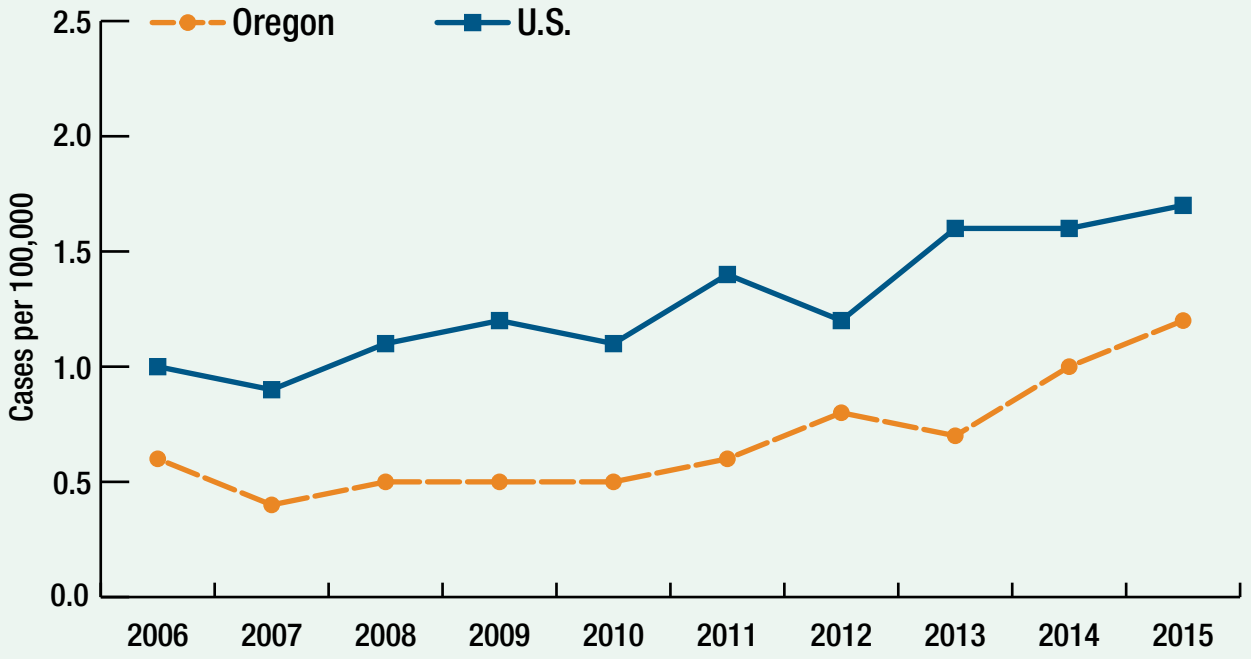
Legionellosis by year: Oregon, 2002–2015



Incidence of legionellosis by age and sex: Oregon, 2006–2015

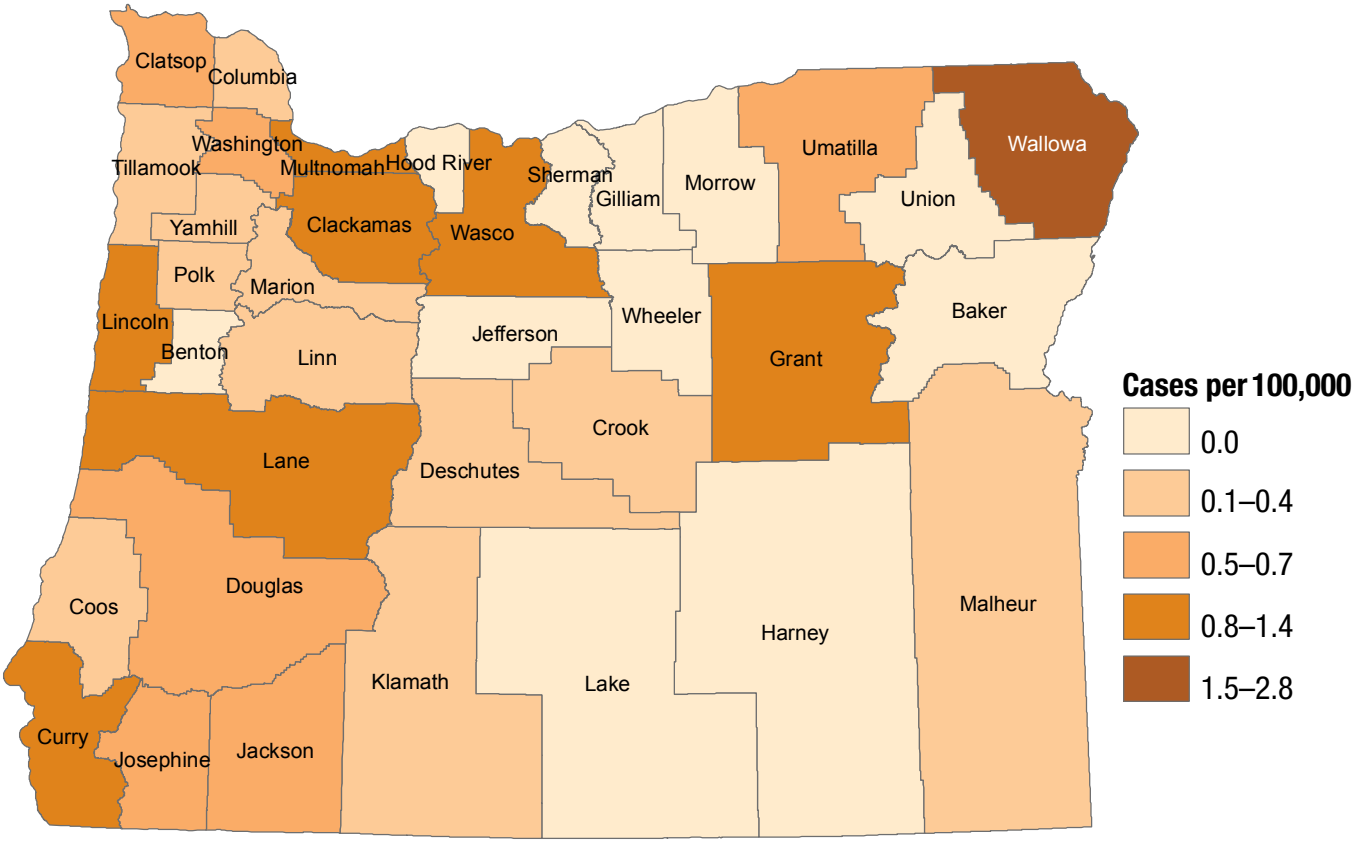


Incidence of legionellosis: Oregon vs. nationwide, 2006–2015



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	0.6	0.4	0.5	0.5	0.5	0.6	0.8	0.7	1.0	1.2
U.S.	1.0	0.9	1.1	1.2	1.1	1.4	1.2	1.6	1.6	1.7

Incidence of legionellosis by county of residence: Oregon, 2006–2015



Prevention

- Not smoking can lower your chances of developing Legionnaire's disease if you are exposed to *Legionella* bacteria.
- Persons at increased risk of infection may choose to avoid high-risk exposures, such as being in or near a hot tub.
- Prevent water conditions that allow *Legionella* to grow:
  - › Maintain and clean cooling towers and evaporative condensers twice yearly, and periodically use chlorine.
  - › Maintain domestic water heaters at 60°C (140°F), and water temperature at 50°C (122°F) or higher at the faucet.
  - › Don't allow water to stagnate. Large water-storage tanks exposed to sunlight can produce warm conditions favorable to growth of the *Legionella*. Flushing of infrequently used water lines will help alleviate stagnation.

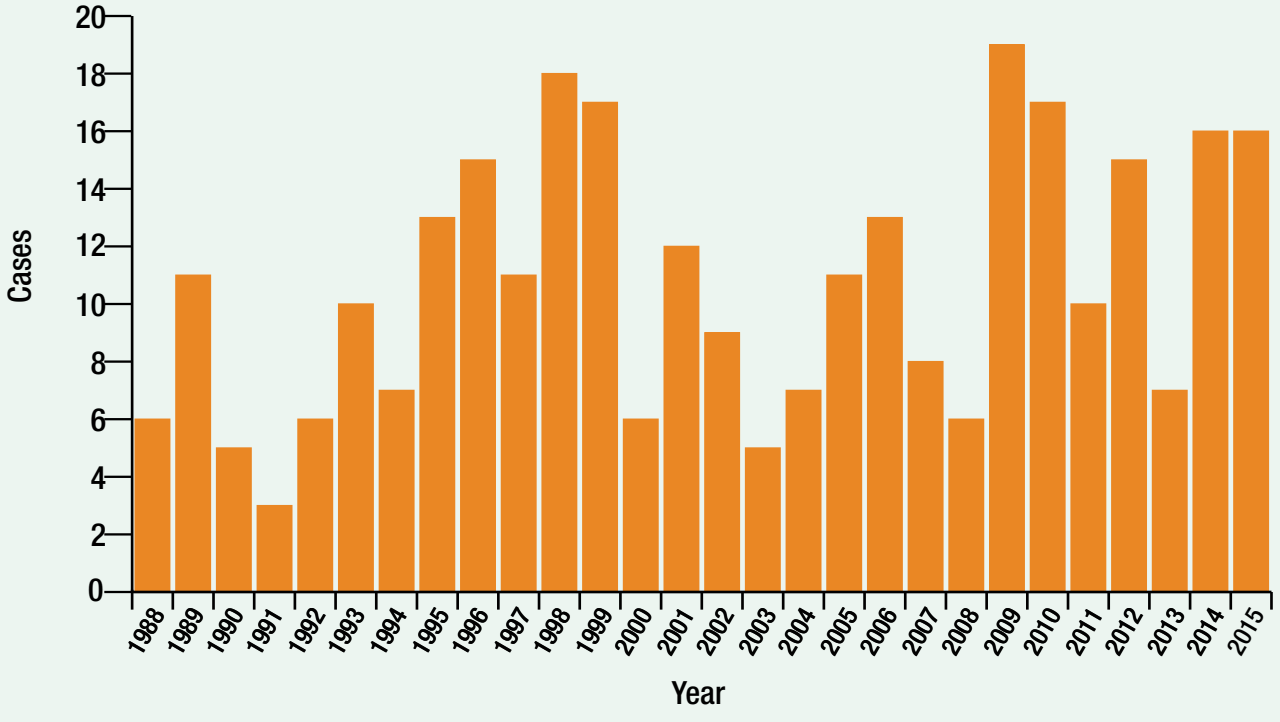
Listeriosis

Listeriosis is a bacterial infection that may present as influenza-like illness with high fever, headache and muscle aches; as a gastrointestinal illness; or as an invasive disease with sepsis or meningitis. In pregnant women, listeriosis may cause miscarriages or stillbirths. The case fatality rate of invasive listeriosis is as high as 30% in infants infected prenatally and in non-pregnant adults.

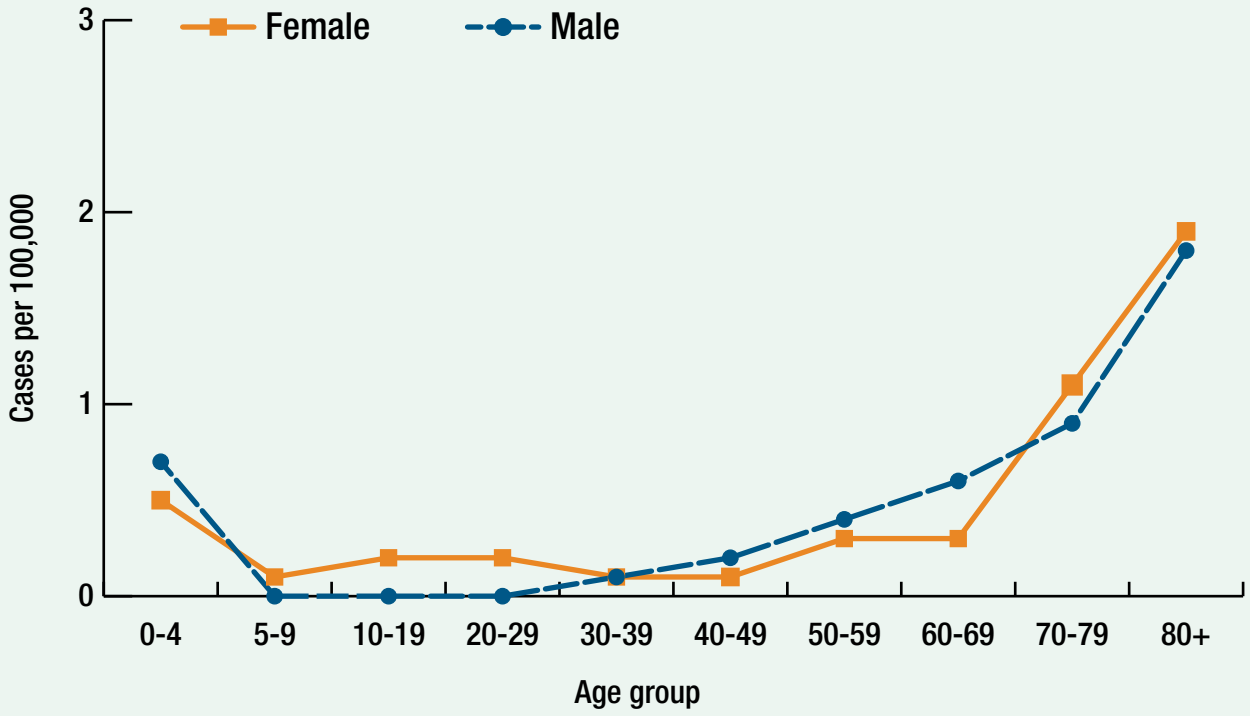
Most cases of listeriosis are "sporadic" rather than part of outbreaks. However, several large outbreaks have been associated with consumption of contaminated foods. It is important to track the incidence of this disease to identify such outbreaks, and to identify high-risk groups. The rate is higher among pregnant women, newborns, the elderly and immunocompromised persons. Cooking food properly is the most important means of prevention. When listeriosis is diagnosed, treatment with antibiotics should be instituted promptly.

In 2015, 16 cases were reported, the same as 2014; there were two deaths (12%). There was one pregnancy-associated case, and one case was part of a multi-state outbreak associated with Canadian-style sour cream.

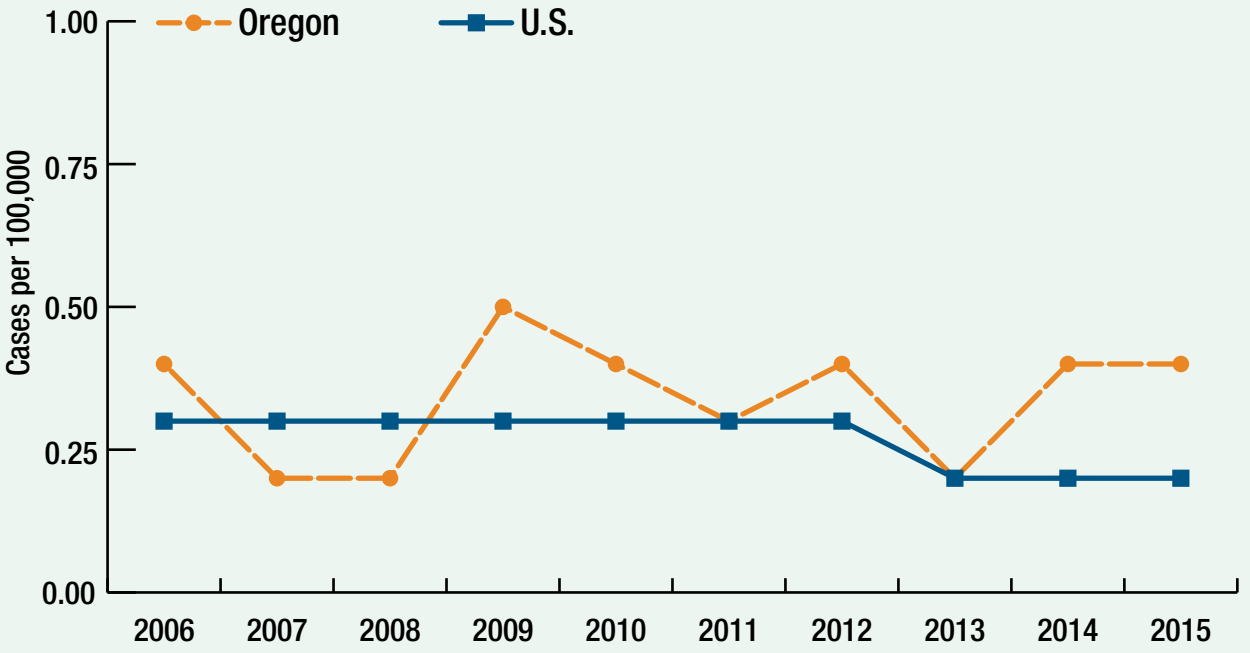
Listeriosis by year: Oregon, 1988–2015



Incidence of listeriosis by age and sex: Oregon, 2006–2015

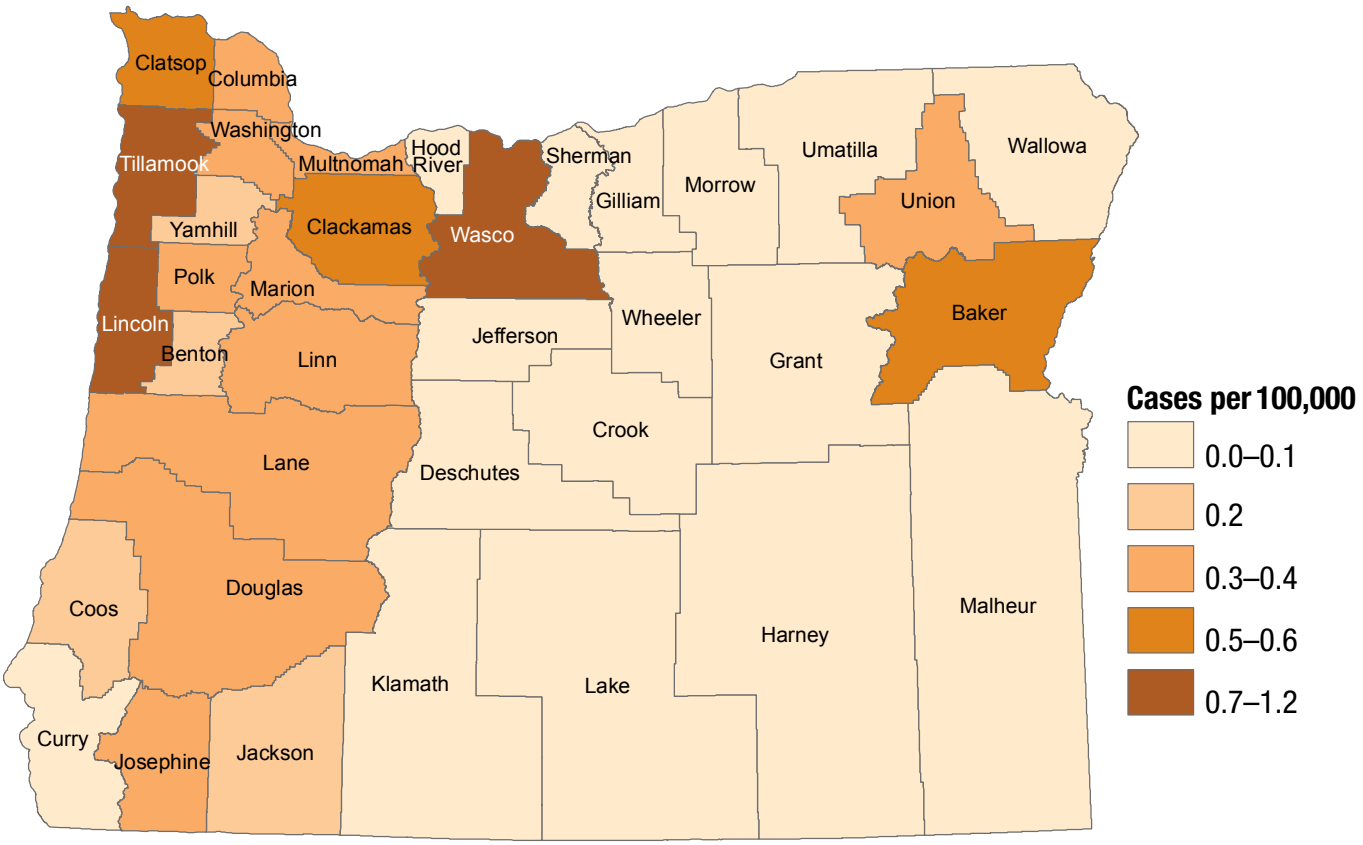


Incidence of listeriosis: Oregon vs. nationwide, 2006–2015



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	0.4	0.2	0.2	0.5	0.4	0.3	0.4	0.2	0.4	0.4
U.S.	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2

Incidence of listeriosis by county of residence: Oregon, 2006–2015



Prevention

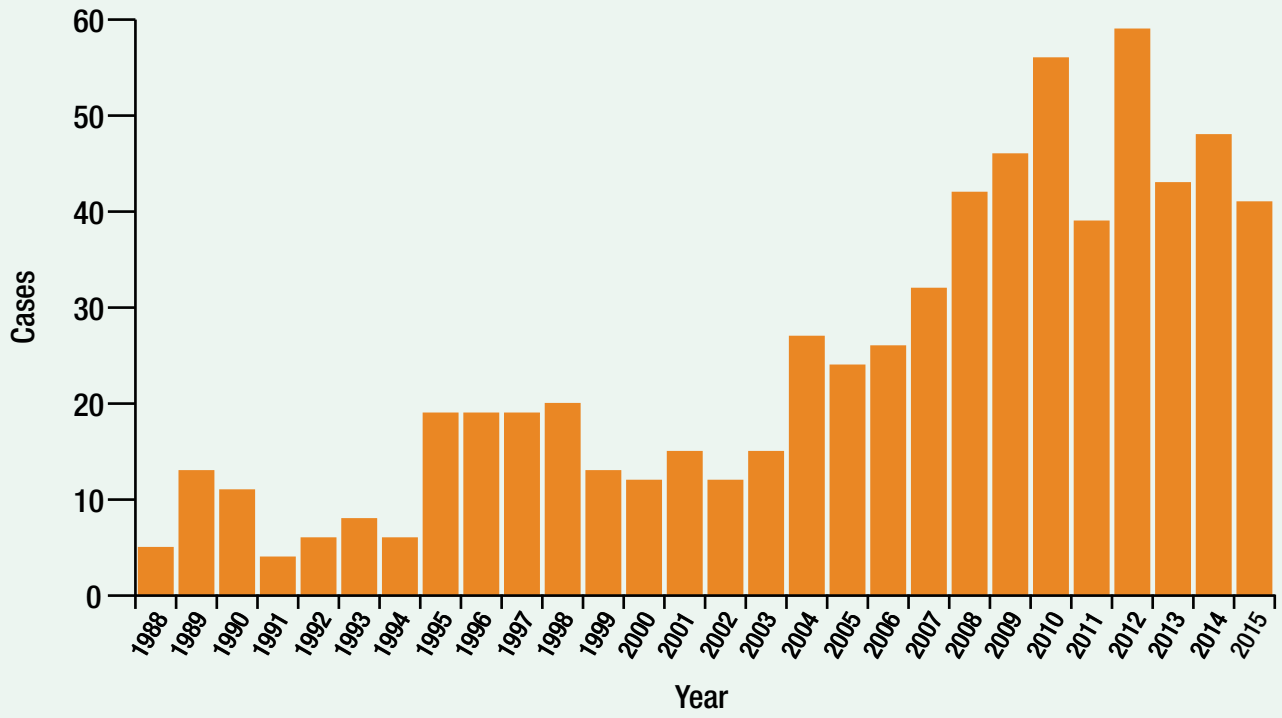
- Practice safe food handling. Rinse raw produce thoroughly under running tap water; separate uncooked meats and poultry from vegetables, cooked foods, and ready-to-eat foods; cook meat and poultry to the proper temperatures.
- Do not drink raw milk and do not eat foods that have unpasteurized milk in them.
- Higher-risk persons (pregnant women, immunocompromised and elderly):
  - › Avoid eating hot dogs, luncheon meats, cold cuts and other deli meats unless they are heated.
  - › Do not eat soft cheese such as feta, queso fresco, Brie, Camembert unless it is labeled as made with pasteurized milk.
  - › Do not eat refrigerated smoked seafood, unless it is contained in a cooked dish such as casserole.

Lyme disease

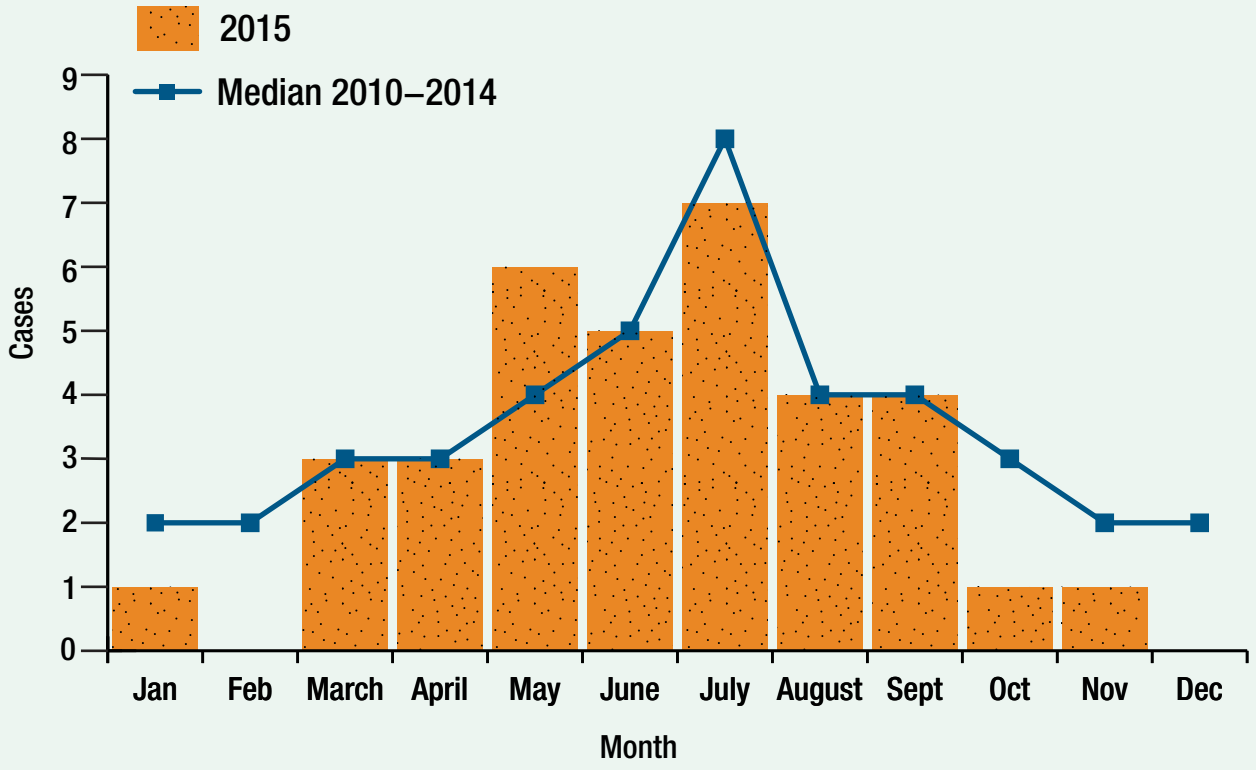
Lyme disease is a tick-borne zoonotic disease caused by the spirochete *Borrelia burgdorferi*. The first manifestation in approximately 60% of patients appears as a red spot or bump that expands slowly with clearing in the middle, forming a ring or "target," or a bull's eye sometimes with multiple similar lesions. This distinctive skin lesion is called "erythema migrans." In most cases, the tick must be attached for 36–48 hours or more before the Lyme disease bacterium can be transmitted. Most humans are infected through the bites of immature ticks called nymphs. Nymphs are tiny (less than 2 mm) and difficult to see, which is why they may be attached for so many hours without being detected. Nymphs feed during the spring and summer months. The incubation period for Lyme disease ranges from three to 30 days after tick exposure; however, the early stages of the illness may be asymptomatic, and the patient may later develop systemic symptoms and joint, neurologic or cardiac problems in varying combinations over a period of months to years. Infections are treated with antibiotics.

Currently, increasing recognition of the disease is redefining areas where ticks may carry *B. burgdorferi*; Lyme disease cases have been reported in 47 states, and in Ontario and British Columbia, Canada. Related borrelioses have been found in Europe, the former Soviet Union, China and Japan. In 1997–1998, CDC and the Oregon Public Health Division collected and identified ticks and tested them for *Borrelia burgdorferi* in Deschutes, Josephine and Jackson counties. No ticks from Deschutes County were identified as carrying *Borrelia* in this study. The organism was isolated in 3.5% of *Ixodes pacificus* ticks tested. During 2015, 41 cases of Lyme disease were reported in Oregon. The median age was 40 years. Twenty-seven (66%) cases were female. Highest number of reported cases (10) was in Clackamas County.

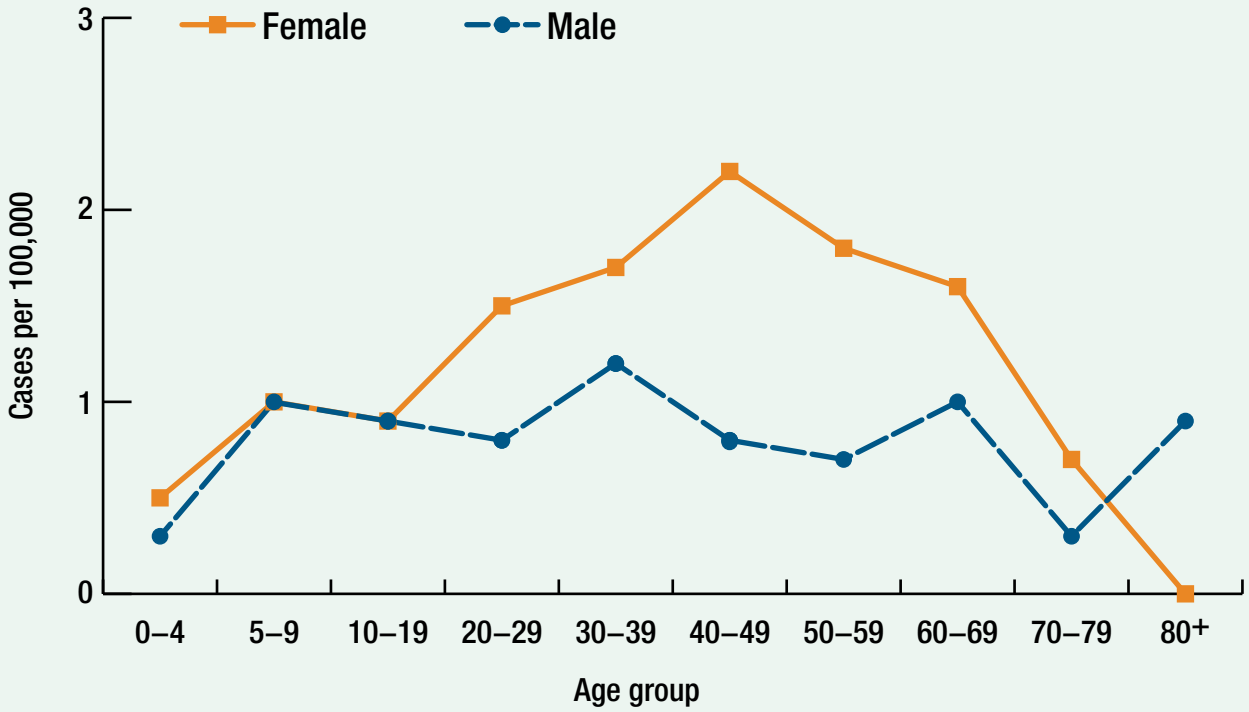
Lyme disease by year: Oregon, 1988–2015



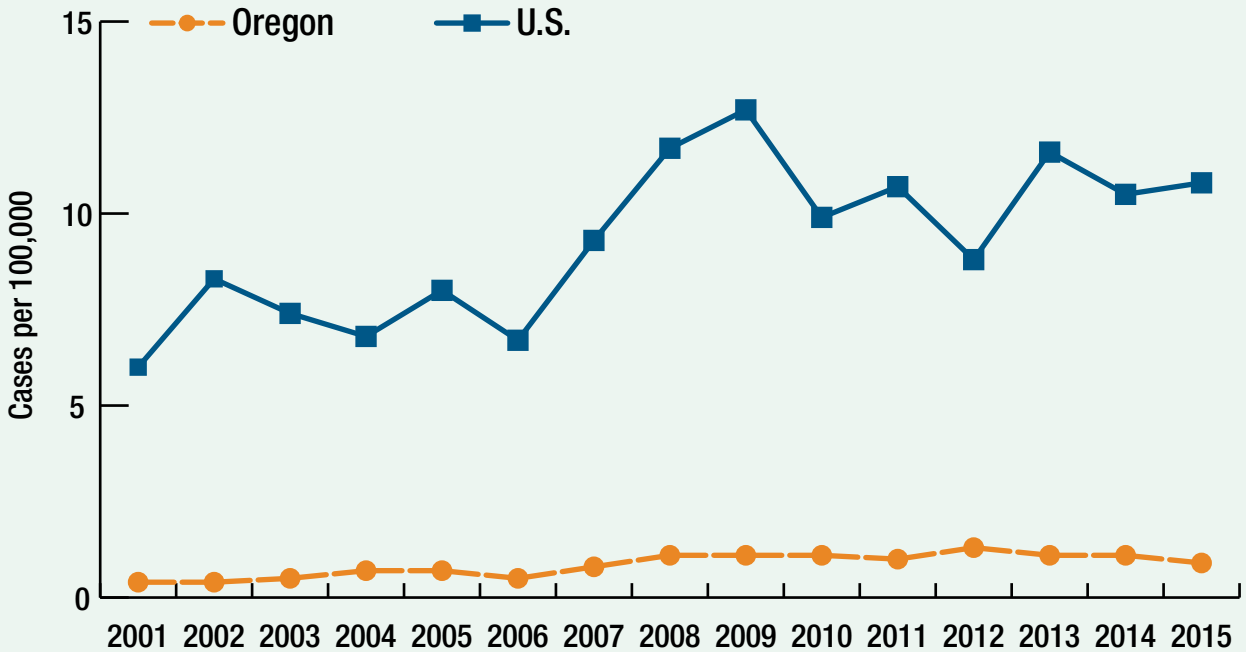
Lyme disease by onset month: Oregon, 2015



Incidence of Lyme disease by age and sex: Oregon, 2006–2015

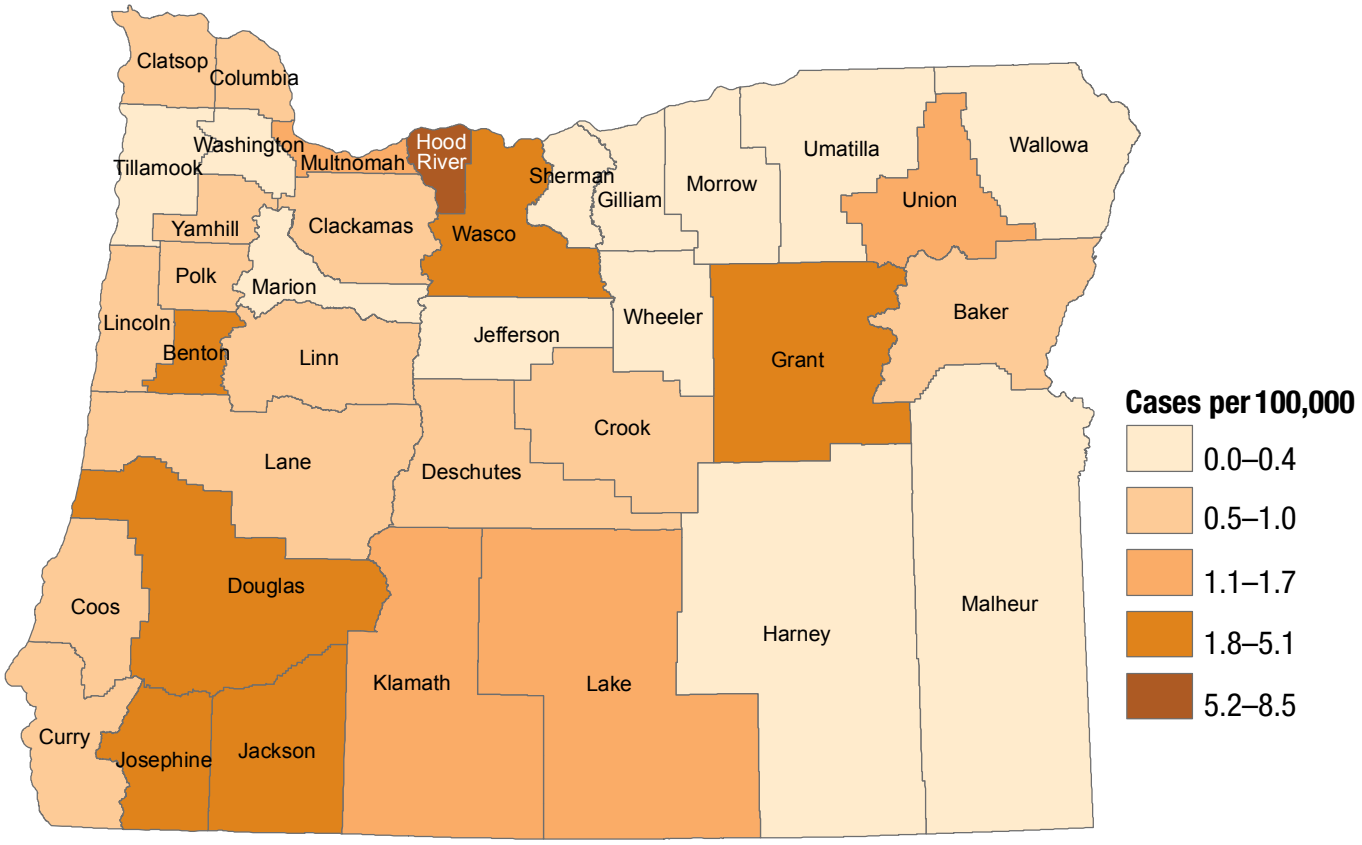


Incidence of Lyme disease: Oregon vs. nationwide, 2001–2015



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	0.4	0.4	0.5	0.7	0.7	0.5	0.8	1.1	1.1	1.1	1.0	1.3	1.1	1.1	0.9
U.S.	6.0	8.3	7.4	6.8	8.0	6.7	9.3	11.7	12.7	9.9	10.7	8.8	11.6	10.5	10.8

Incidence of Lyme disease by county of residence:* Oregon, 2006–2015



*Not necessarily county of acquisition

Prevention

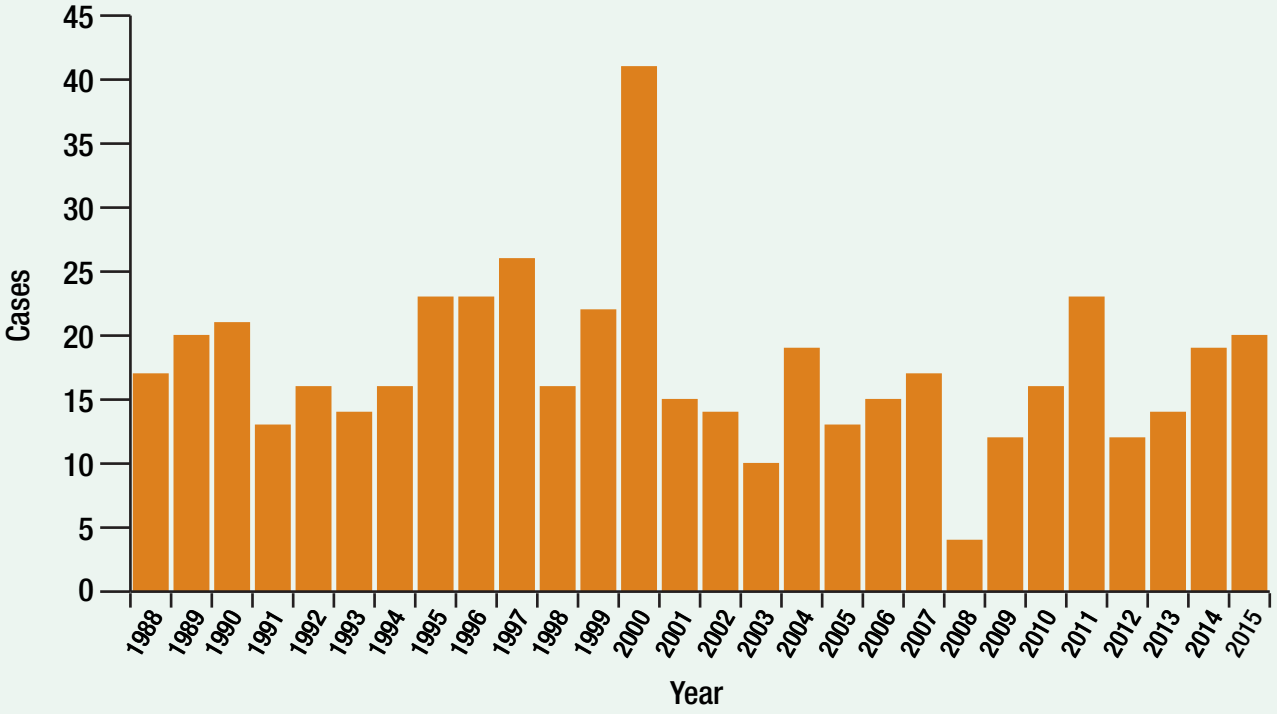
- Avoid exposure to ticks: wear long sleeves, long pants and socks when outdoors.
- Check yourself, your children and your pets for ticks. Be especially vigilant after spending time in wooded or grassy areas. Remove a tick as soon as possible with tweezers. Gently grasp the tick near its head or mouth. Don't squeeze or crush the tick, but pull carefully and steadily.
- Use insect repellents when you go outdoors. Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-3,8-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions.
- Do your best to tick-proof your yard. Clear brush and leaves where ticks live. Keep woodpiles in sunny areas.

Malaria

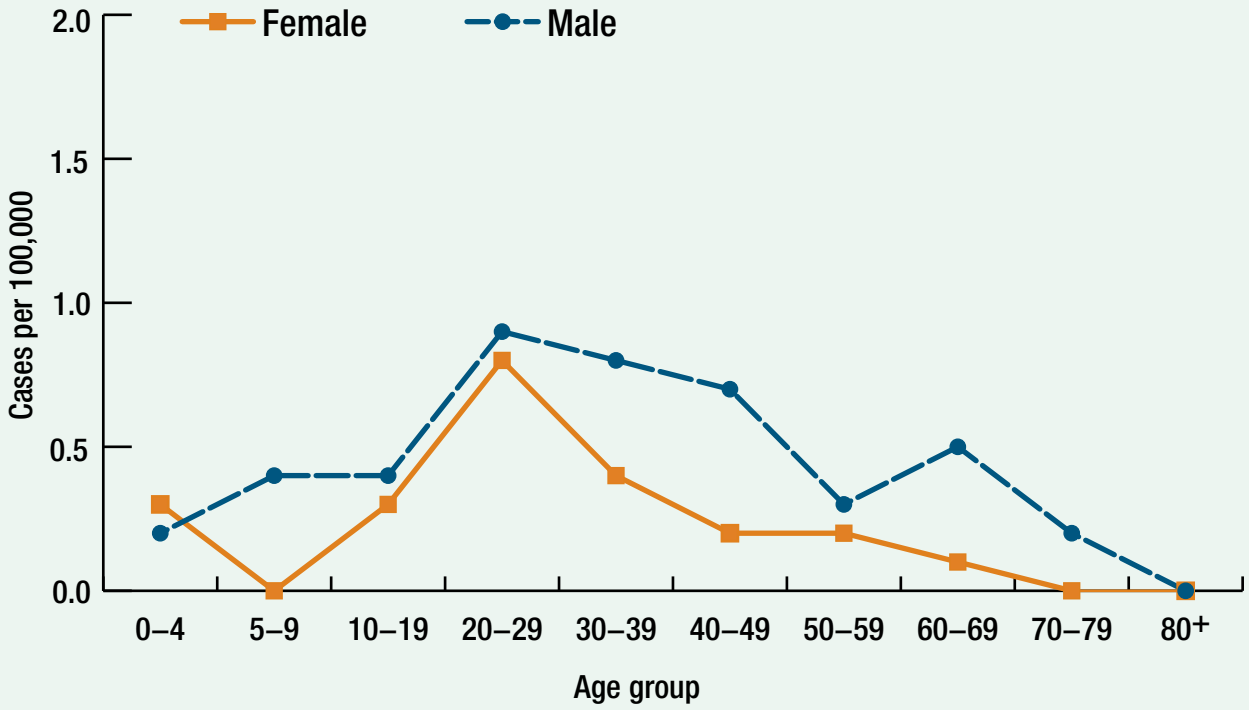
Worldwide, malaria is one of the most devastating of the communicable diseases, causing perhaps 1–2 million deaths annually, in addition to an enormous burden of disability and medical costs. It is caused by parasites of the genus *Plasmodium* that are transmitted among humans by *Anopheles* mosquitoes. While transmission has not been documented in Oregon for decades, malaria is reported every year in our state; all cases have resulted from exposures outside the United States. *Anopheles* mosquitoes capable of transmitting malaria live in Oregon, so local transmission remains a theoretical possibility — albeit one we don't lose much sleep over.

Twenty cases of laboratory confirmed malaria were reported in Oregon in 2015. Twelve (60%) were *Plasmodium falciparum* — the worst kind to have and the most common worldwide. Oregon surveillance data contribute to the national database, which tailors recommendations for prevention and treatment. Of the 20 Oregon cases reported in 2015, 17 (85%) reported pre-onset travel in Africa or were immigrants from Africa. One case had been in Central America and two in Asia. Competent advice about behavioral and chemical interventions can reduce risk to travelers, but refugees and other immigrants may carry long-harbored infections.

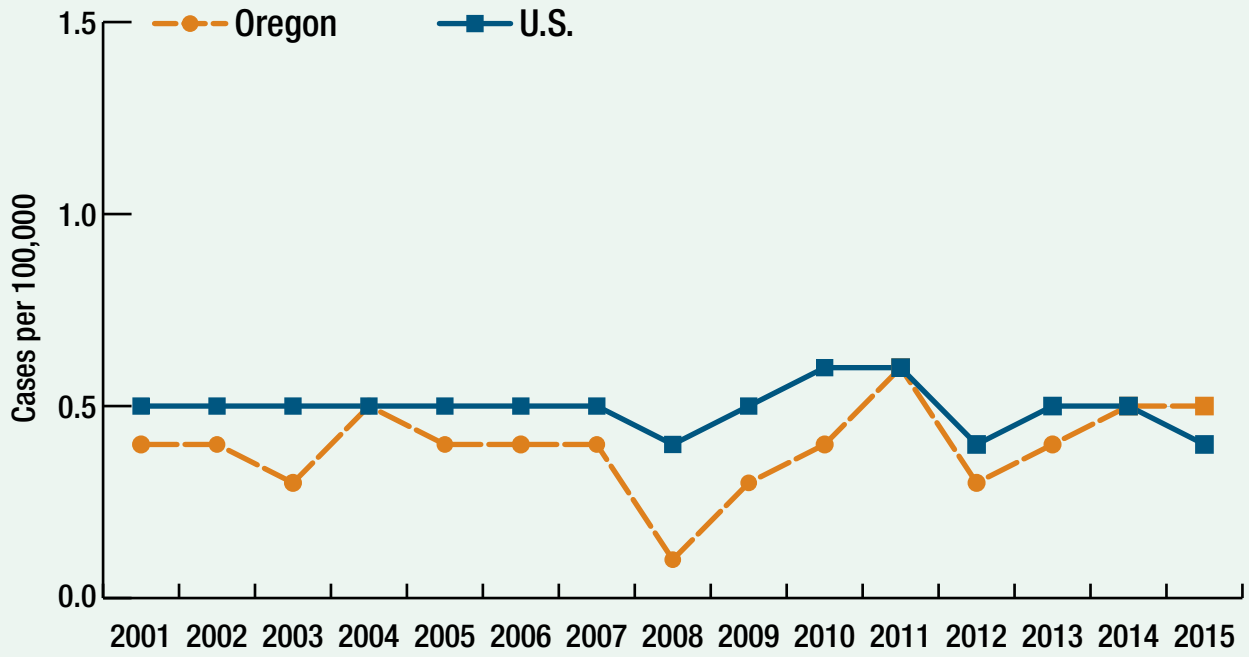
Malaria by year: Oregon, 1988–2015



Incidence of malaria by age and sex: Oregon, 2006–2015

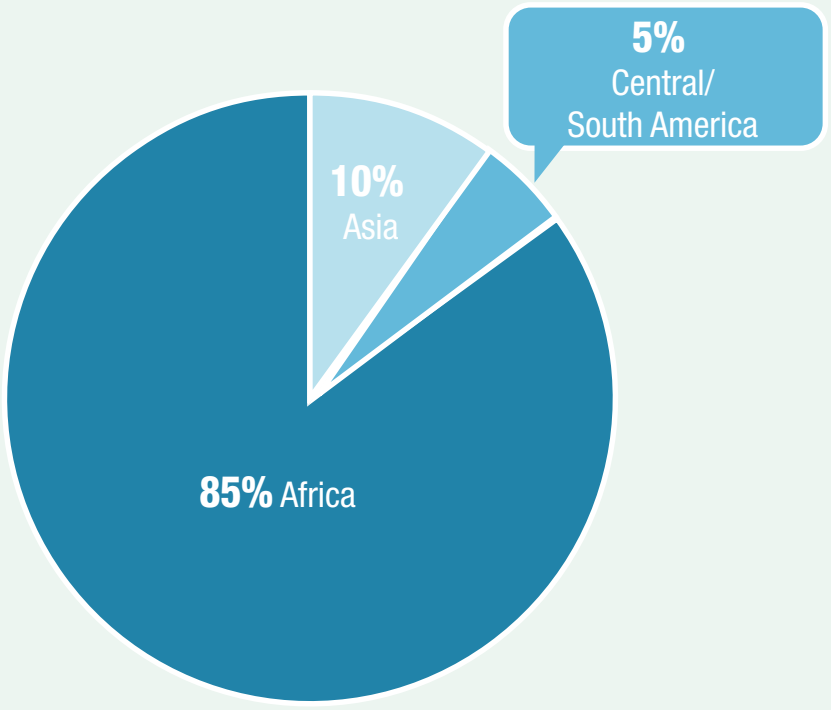


Incidence of malaria: Oregon vs. nationwide, 2001–2015



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.1	0.3	0.4	0.6	0.3	0.4	0.5	0.5
U.S.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.4	0.5	0.5	0.4

Malaria cases by continent of acquisition: Oregon, 2015



Prevention

- Understanding the current situation with malaria in one's travel destinations is essential. Consult with a travel medicine expert or, if nothing else, read the country-by-country assessment online from CDC (http://www.cdc.gov/malaria/travelers/country_table/a.html).
- Because *Anopheles* mosquitoes feed at night, minimize your risk of getting bitten by sleeping under an insecticide-impregnated mosquito net or in an air-conditioned room (or both!).
- If out and about at night, wear long-sleeved shirts and pants and use topical mosquito repellents.
- Chemoprophylaxis (antibiotic medicine) provides the backstop you need when bite prevention is imperfect — as it always is. Many effective medicines are available in the U.S. (http://www.cdc.gov/malaria/travelers/drugs.html), and even more elsewhere. Weighing their relative merits and side effects can be complex; consult a travel expert for individualized advice. Don't wait until the last minute; most drugs should be started before and continued after the likely exposure period. See http://www.cdc.gov/malaria/travelers/drugs.html for a list.

Measles

Measles is an acute, highly communicable viral illness known for its red, blotchy rash, which starts on the face and then spreads widely over the body. The rash is preceded by a febrile prodrome that includes cough, coryza and conjunctivitis, and sometimes photophobia and "Koplik spots" in the mouth.

Detection of measles-specific IgM antibody and measles RNA by polymerase chain reaction are the most common methods for confirming measles infection (in a patient who has not recently been immunized). Treatment is supportive.

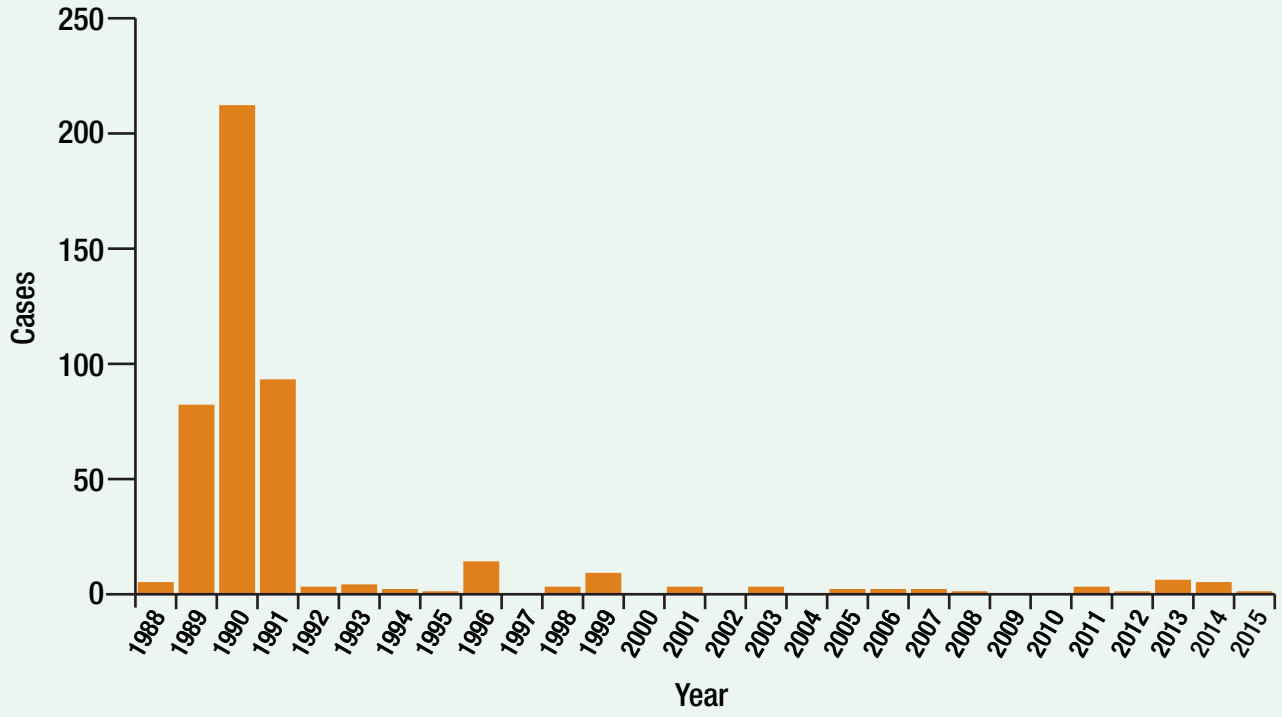
A focus on increasing vaccination among preschool children by following the 1989 recommendation for two doses of MMR vaccine resulted in a dramatic reduction in measles in the United States. In Oregon, two doses of measles-containing vaccine have been required for entry into kindergarten since 1998. In 2015, >94% of kindergartners had received two doses.

Since 2004, 23 cases have been reported in Oregon; 13 of these were imported and another 10 were linked to imported cases. Most imported cases originated in Asia or Europe, and occurred both among Oregon citizens traveling abroad and in persons visiting Oregon from other countries. The median age of cases has been 7 years (range, 9 months–49 years). Fifteen cases were unvaccinated, five were vaccinated, the vaccination status of two could not be documented and one was too young for vaccine.

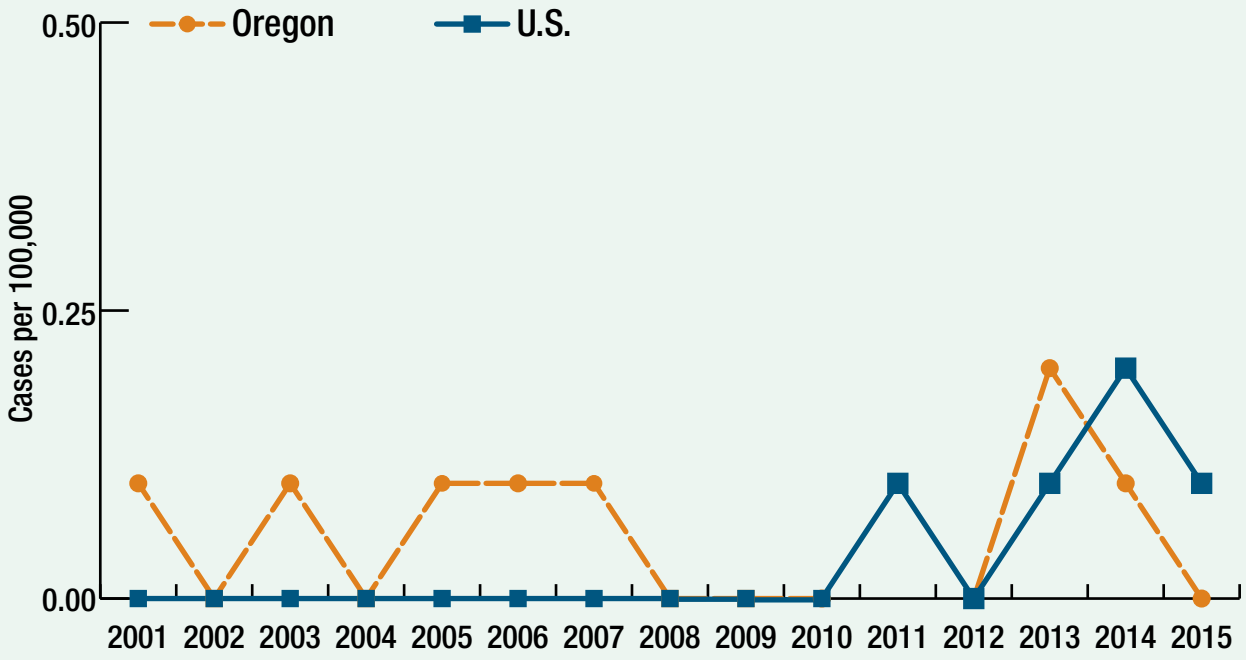
One Oregon case was reported in 2015 linked to an outbreak associated with Disneyland. Five Oregonians caught the measles during 2014; all were preventable. Four cases were in unvaccinated preschool or school-aged children linked to international importation. One was an internationally imported case in an unvaccinated infant. Although measles vaccine is not typically recommended before 12 months of age, the Advisory Committee on Immunization Practices (ACIP) recommends that infants as young as 6 months of age receive one dose of measles vaccine before any international travel.

Though measles is highly infectious, the risk of exposure to measles in Oregon remains low. Sustaining high levels of vaccination is important to limit the spread of measles from imported cases and to prevent it from becoming re-established as an endemic disease in the United States.

Measles by year: Oregon, 1988–2015

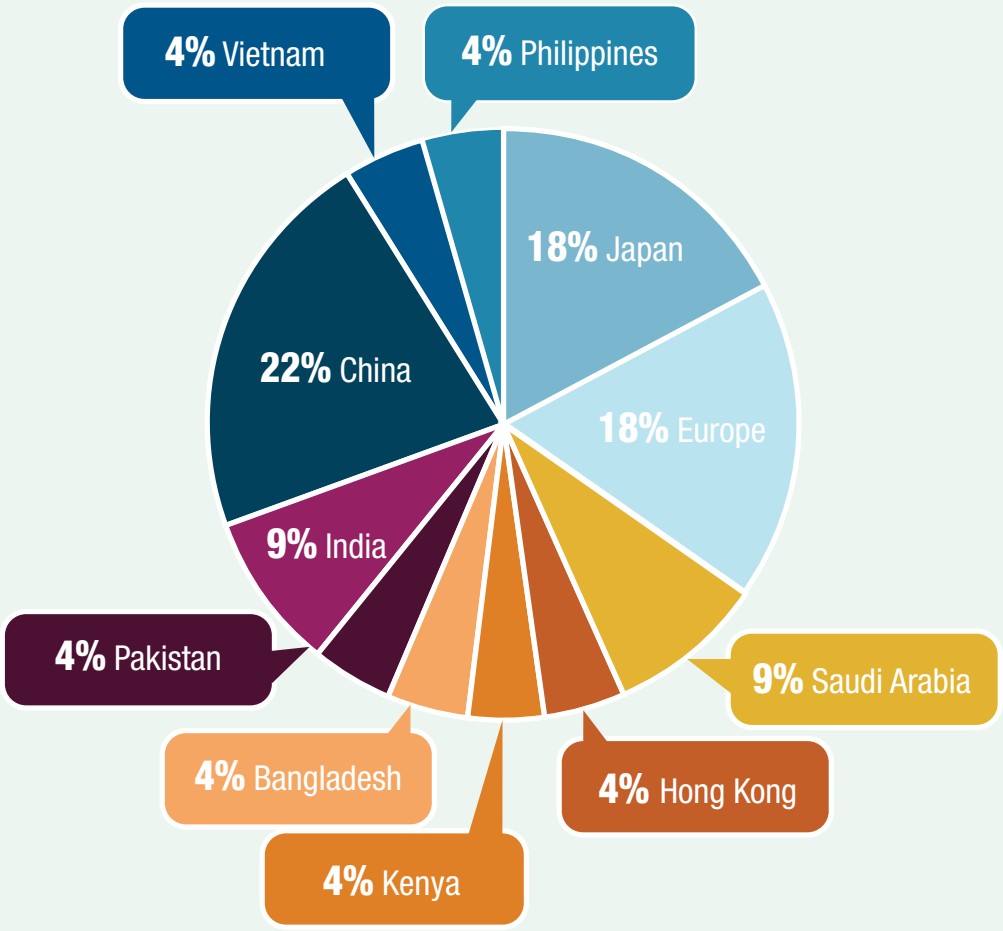


Incidence of measles: Oregon vs. nationwide, 2001–2015



Oregon	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.0
U.S.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1

Measles by country of importation: 1997–2015



Prevention

- Vaccinate:
  - › One dose for preschool-age children >12 months of age and for persons born during or after 1957; and a second dose for school-age children and for adults at high risk of measles exposure (e.g., health care personnel, international travelers and students at post-high school educational institutions).
  - › Post-exposure vaccination can prevent or lessen illness if given within 72 hours of exposure.

Meningococcal disease

Reported cases of invasive meningococcal infections, including sepsis and meningitis, have declined from the hyperendemic levels seen in 1993–1997 attributable to a clonal strain of serogroup B *Neisseria meningitidis*. Respiratory secretions and droplets continue to be shared among Oregonians and predispose us to secondary cases.

In 2015, there were 29 reported cases and six deaths from meningococcal disease in Oregon. From the early 1990s through 2011, serogroup B predominated in Oregon, but in 2011 and again in 2013–2014, other serogroups have been more prominent. In 2015 however, serogroup B accounted for 52% (14) of the serogrouped cases, whereas 26% (7) of cases were serogroup C. In 2015, there was a meningococcal serogroup B outbreak in a large public university, with 6 cases among university students and one death. Four mass vaccination clinics were held at the university with the goal of vaccinating all undergraduate students. Approximately 6% of the undergraduate students completed the vaccine series at the mass vaccination clinics.

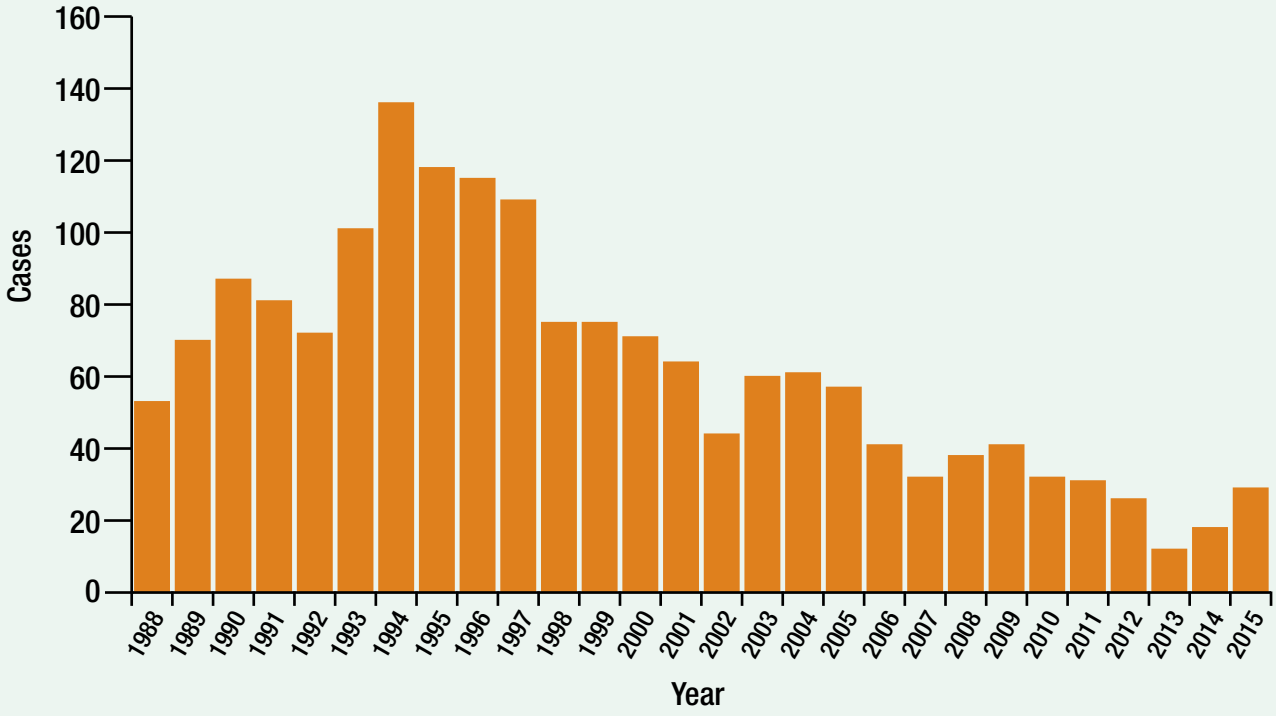
The burden of meningococcal disease was highest in those ≤5 years of age (2.5/100,000). Meningococcal disease is treated with intravenous antibiotics.

American Committee on Immunization Practices (ACIP) recommends routine vaccination with quadrivalent (contains antigens from serogroups A, C, Y and W-135) meningococcal conjugate vaccine for all persons 11–21 years of age. Meningococcal vaccine is also recommended for persons 2 months to 55 years of age who are at increased risk for the disease due to complement deficiency, travel to or residence in a country where meningococcal disease is hyperendemic or epidemic, or inclusion in a defined risk group during a community or institutional outbreak.

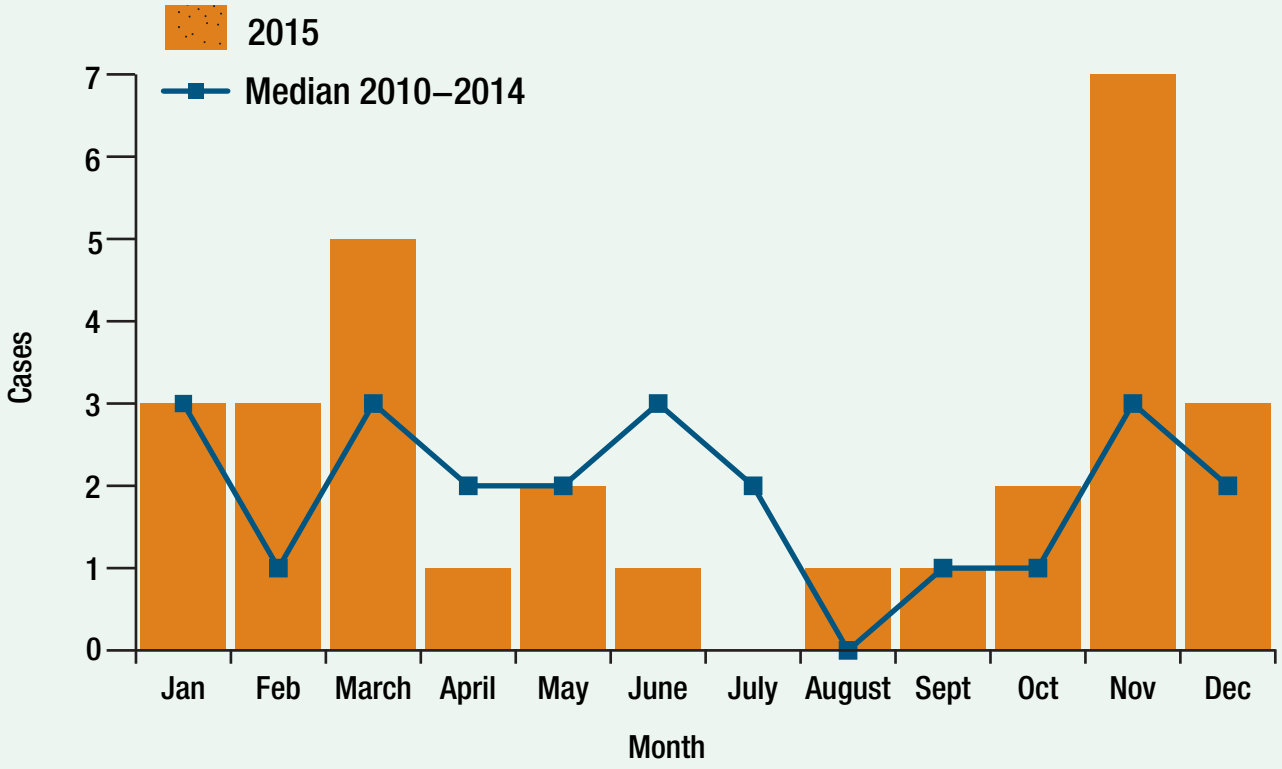
In October 2014, the Food and Drug Administration (FDA) licensed the first serogroup B meningococcal vaccine (MenB-FHbp, Trumenba®). FDA approved this vaccine for use in people 10–25 years of age as a three-dose series. On Jan. 23, 2015, FDA licensed a second serogroup B meningococcal vaccine (MenB-4C, Bexsero®). FDA approved this vaccine for use in people 10–25 years of age as a two-dose series.

MenB vaccination is now recommended for those ≥10 years with complement deficiencies, anatomic or functional asplenia, microbiologists who have contact with *N. meningitidis*, and others at increased risk during a serogroup B outbreak. MenB vaccine may also be administered to adolescents and young adults 16–23 years of age to provide short term protection against most strains of serogroup B meningococcal disease.

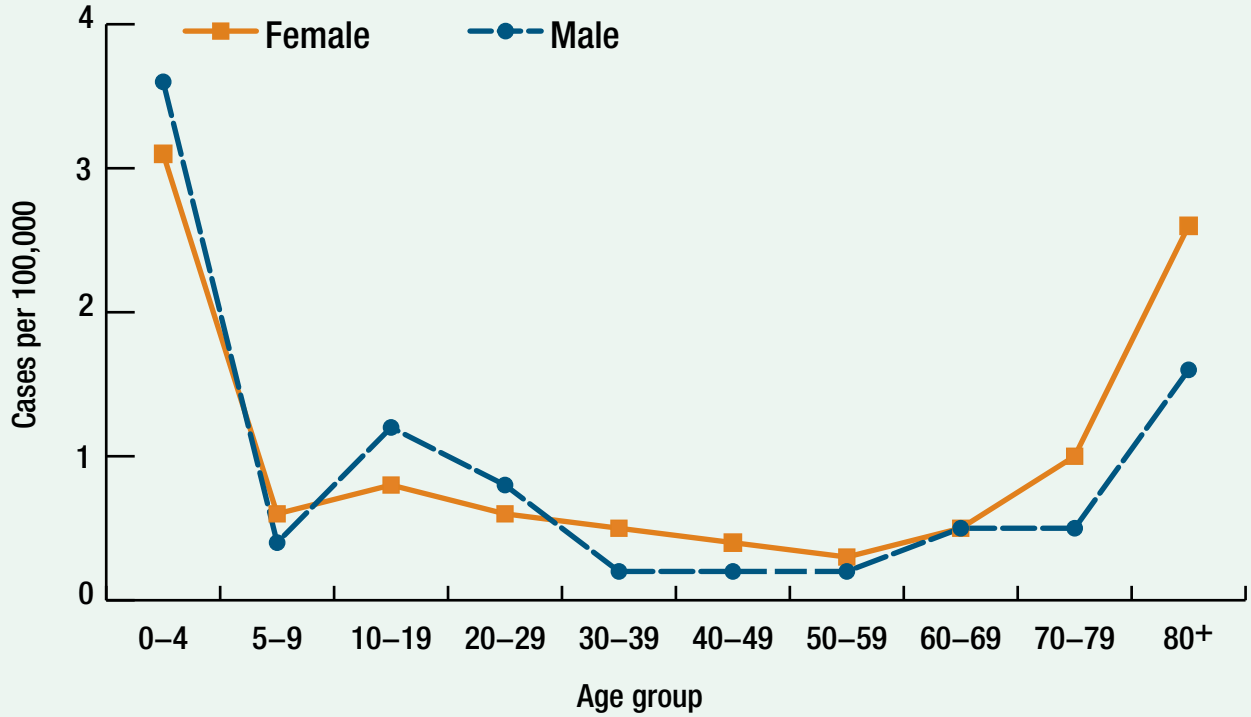
Meningococcal disease by year: Oregon, 1988–2015



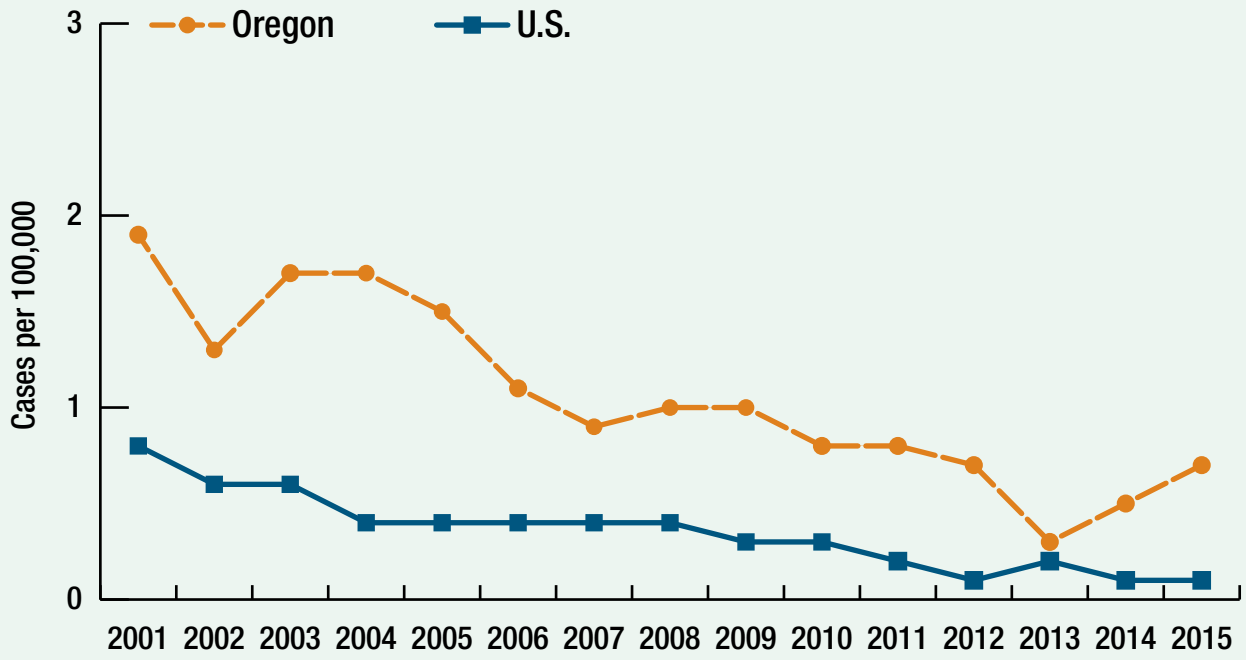
Meningococcal disease by onset month: Oregon, 2015



Incidence of meningococcal disease by age and sex: Oregon, 2006–2015

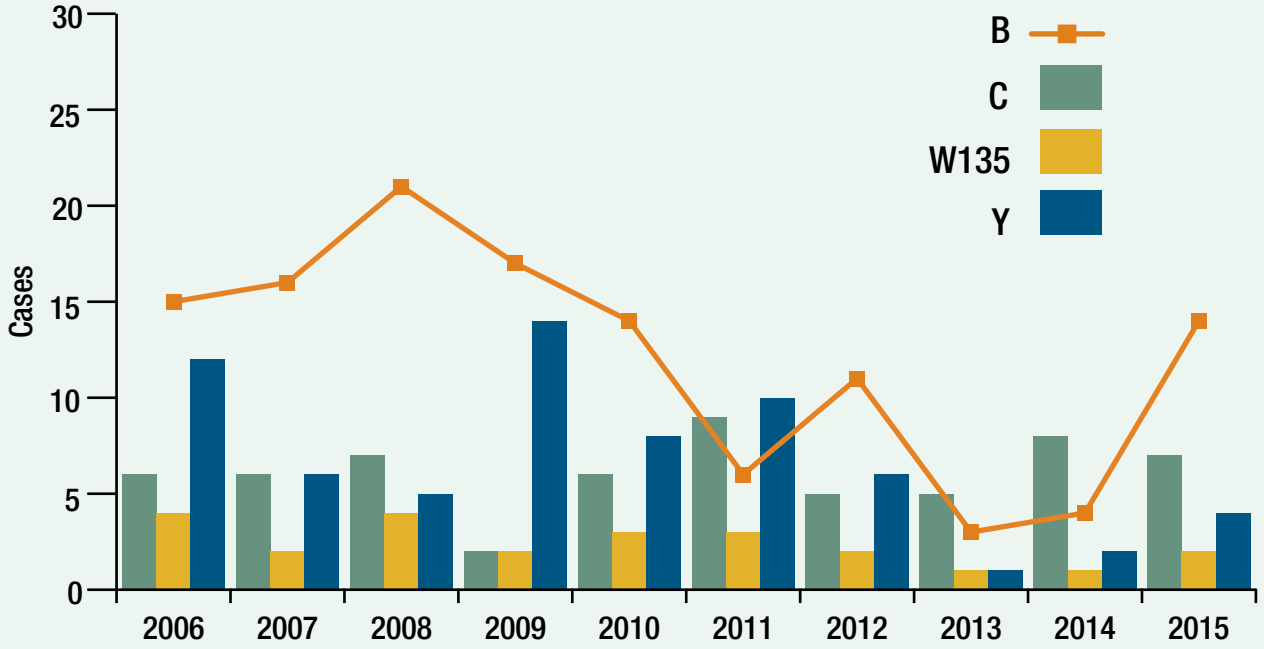


Incidence of meningococcal disease: Oregon vs. nationwide, 2001–2015



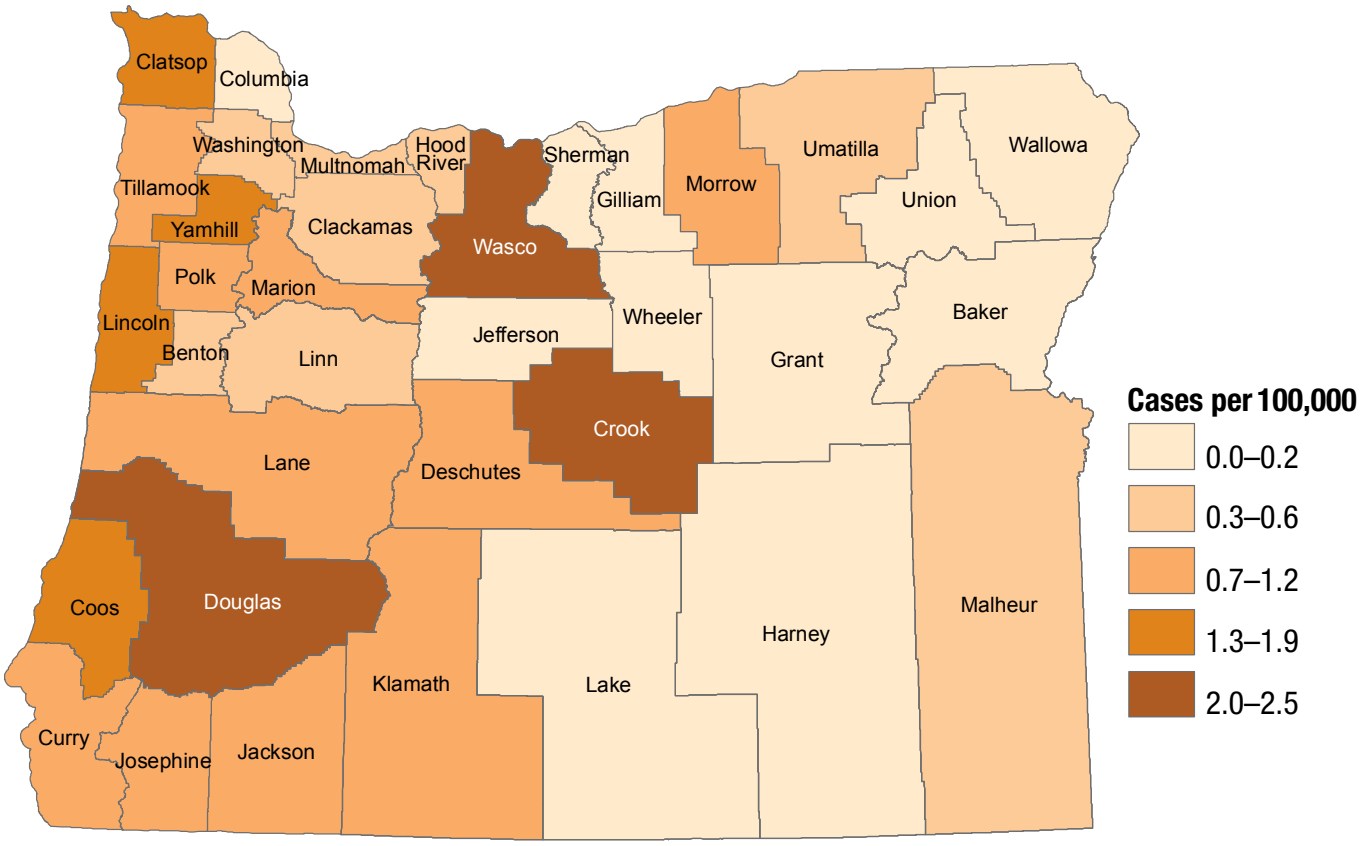
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	1.9	1.3	1.7	1.7	1.5	1.1	0.9	1.0	1.0	0.8	0.8	0.7	0.3	0.5	0.7
U.S.	0.8	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.1	0.1

Meningococcal disease by serogroup: Oregon, 2006–2015



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
B	15	16	21	17	14	6	11	3	4	14
C	6	6	7	2	6	9	5	5	8	7
W135	4	2	4	2	3	3	2	1	1	2
Y	12	6	5	14	8	10	6	1	2	4

Incidence of meningococcal disease by county of residence: Oregon, 2006–2015



Prevention

- Vaccinate to prevent illness from serogroups A, C, Y, W-135 per ACIP guidelines.
- Vaccinate to prevent illness from serogroup B per ACIP guidelines.
- Identify and recommend prophylaxis of close contacts of confirmed and presumptive cases.
- Avoid smoking and exposing children to tobacco smoke, which have been associated with an increased risk of invasive meningococcal disease.

Mumps

Mumps is an acute viral illness characterized by fever and swelling of the salivary glands, typically the parotids. Transmission is generally through respiratory droplets or through direct contact with nasal secretions.

Once an almost universal childhood infection, mumps incidence decreased in the United States with routine childhood vaccination. Reporting of this vaccine-preventable viral infection was discontinued in Oregon in 1981 but reestablished July 1, 2006, prompted by outbreaks.

Three cases were reported in Oregon during 2015.

Because as many as 20% of mumps virus infections are asymptomatic, and nearly 50% are associated with nonspecific or primarily respiratory symptoms (with or without parotitis), mumps infections are significantly underreported.

Prevention:

- One dose of vaccine (as MMR) for all children at 12–15 months of age.
- A second dose (as MMR) for school-age children and for adults at high risk of mumps exposure (e.g., health care personnel, international travelers and students at post-high-school educational institutions).
- One dose of vaccine (as MMR) for all persons born during or after 1957 who are not at high risk of mumps exposure.

Pertussis

Pertussis is a highly contagious, acute respiratory infection caused by the bacterium *Bordetella pertussis*. It is transmitted from person to person through contact with respiratory secretions (i.e., droplet transmission). The disease is most severe in infants and young children, many of whom suffer the intense fits of coughing that may end with an inspiratory "whoop." Although the disease may be milder in older persons, any infected person can transmit the disease to other susceptible persons, including unimmunized or incompletely immunized infants.

Despite high childhood immunization coverage rates, pertussis remains endemic in the U.S., with epidemics every 3–5 years. In 2012, Oregon experienced a pertussis epidemic with the most cases (910) seen in a single year since 1953. Because pertussis often goes undiagnosed in adolescents and adults, it is likely the actual number of cases greatly exceeds the number reported.

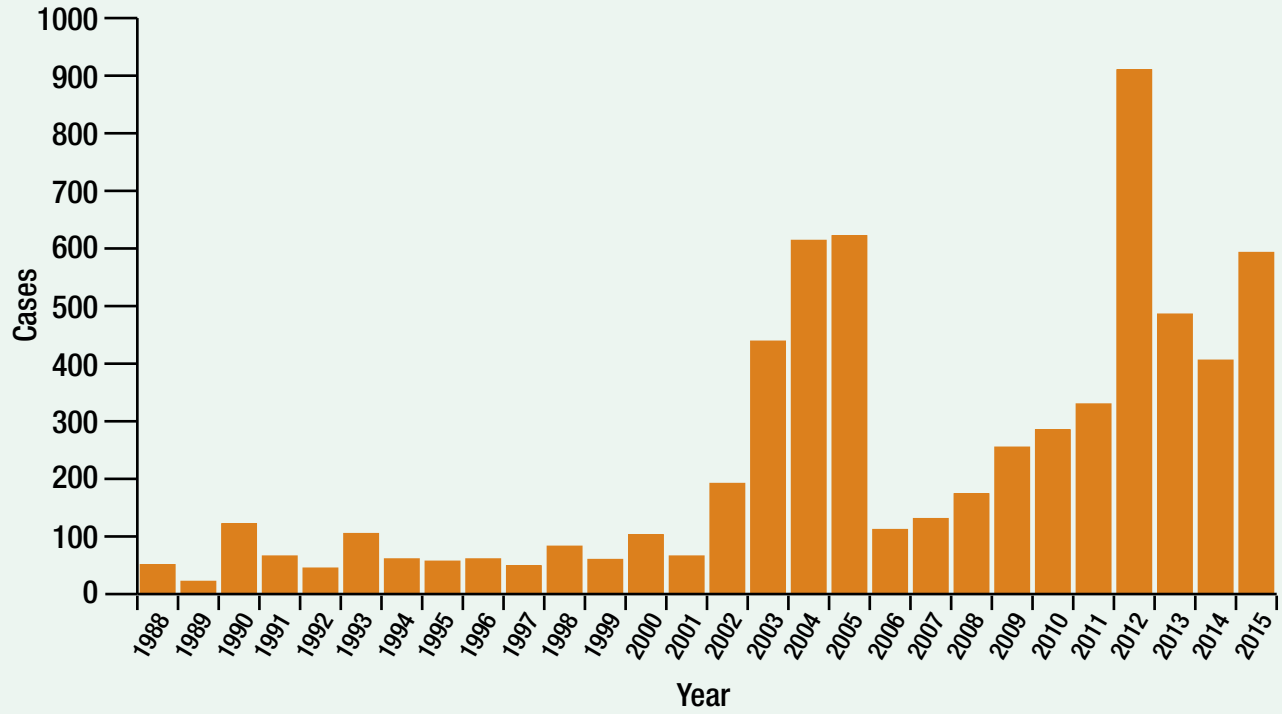
In 2015, the reported pertussis incidence in Oregon was 14.8/100,000 (593 cases) and well above the national incidence rate of 5.7/100,000. The incidence among infants has consistently been higher than all other age groups.

Infants with pertussis are also the most likely to suffer complications and death. Since 2003, 245 (36%) of the 689 infants diagnosed with pertussis in Oregon have been hospitalized and five have died.

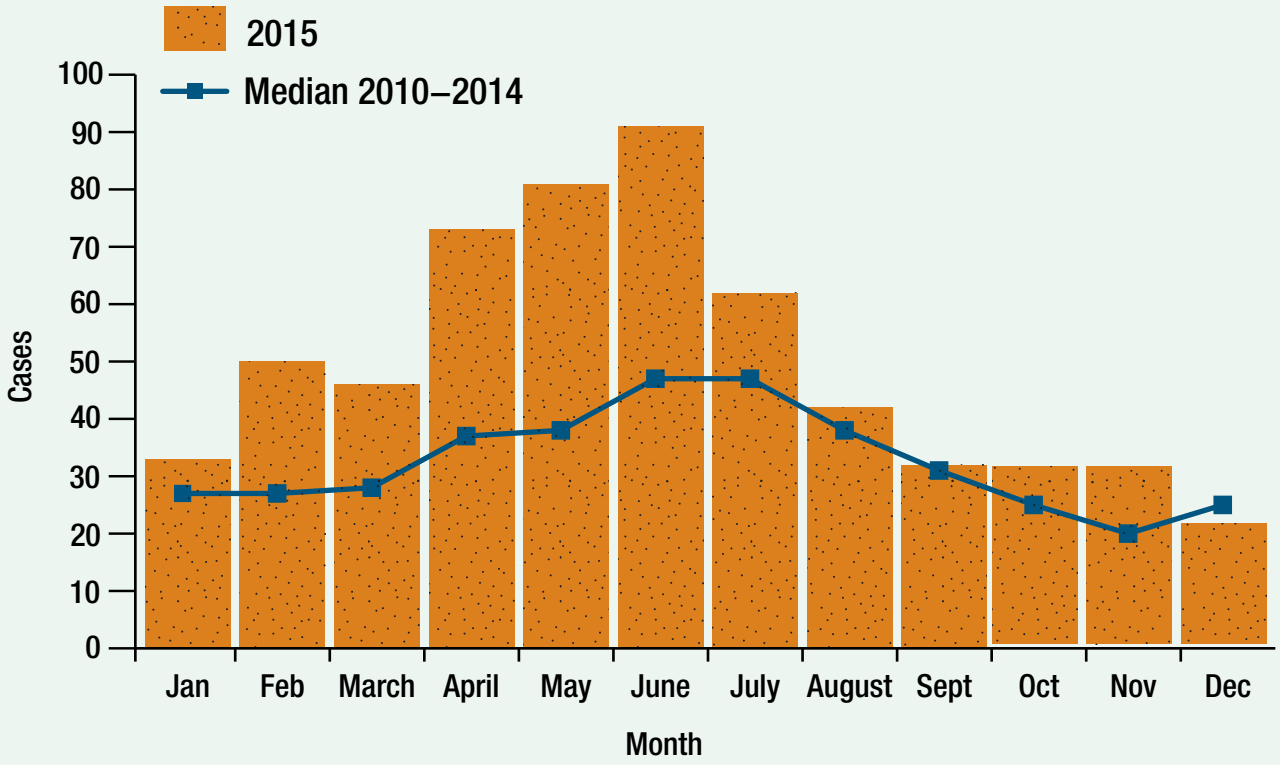
The incidence has been increasing in recent years among adolescents and adults. Since 2003, 51% of pertussis cases reported in Oregon have been in children >10 years of age. The year 2015 was also noteworthy for a historically high proportion of reported pertussis cases among older teenagers. The increased burden among school-aged children and adolescents is also reflected in the 21 outbreaks reported in school settings last year. Immunity wanes with time, so adolescents and adults need a Tdap booster dose, both to protect themselves and to avoid spreading it to vulnerable infants. All persons ≥10 years of age who have not already received Tdap are advised to get a single dose. Pregnant women should receive Tdap preferably at 27–36 weeks' gestation, so they can develop antibodies to pertussis and pass them to their babies before birth. Vaccination of health care workers is strongly encouraged. Children need a series of five DTaP vaccinations before kindergarten, starting at two months of age.

Since 2010, with funding from the CDC, Oregon launched the Metropolitan Area Pertussis Surveillance (MAPS) project, with enhanced surveillance for pertussis in Clackamas, Multnomah and Washington counties. Each reported case is investigated extensively and standardized data are collected. These data help guide regional and national public health policy.

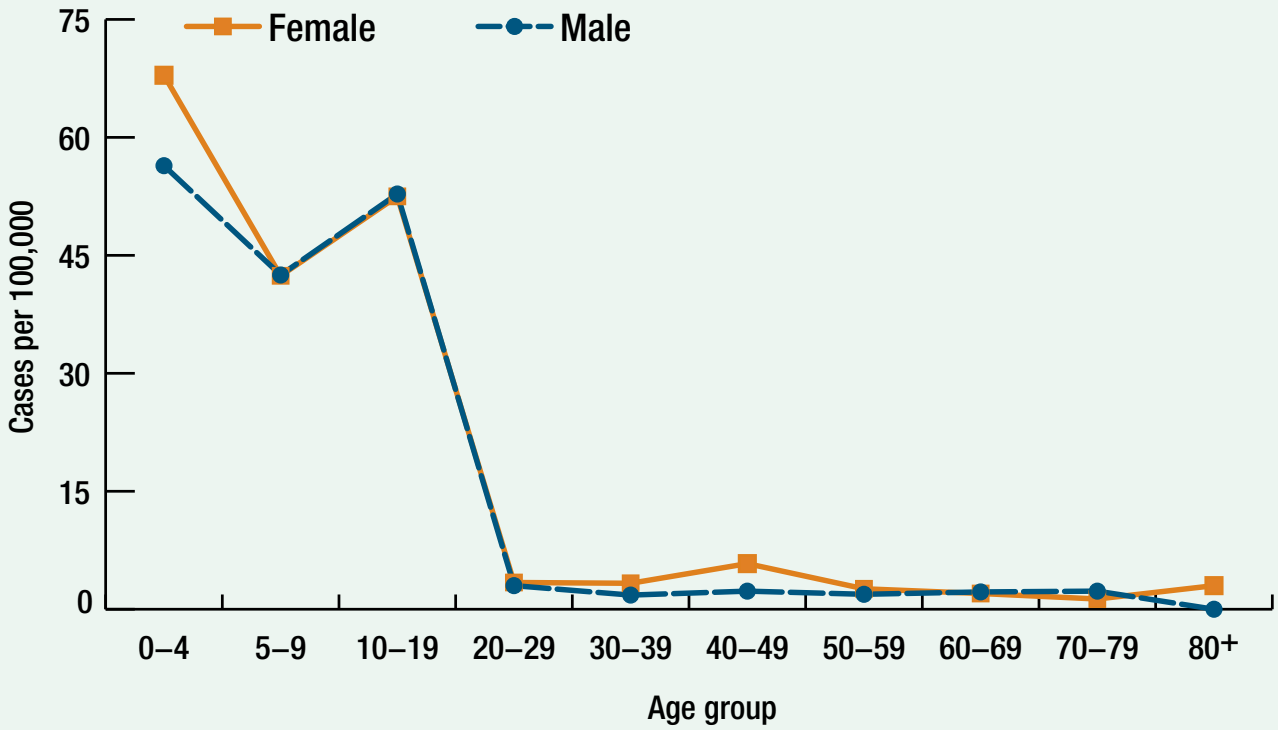
Pertussis by year: Oregon, 1988–2015



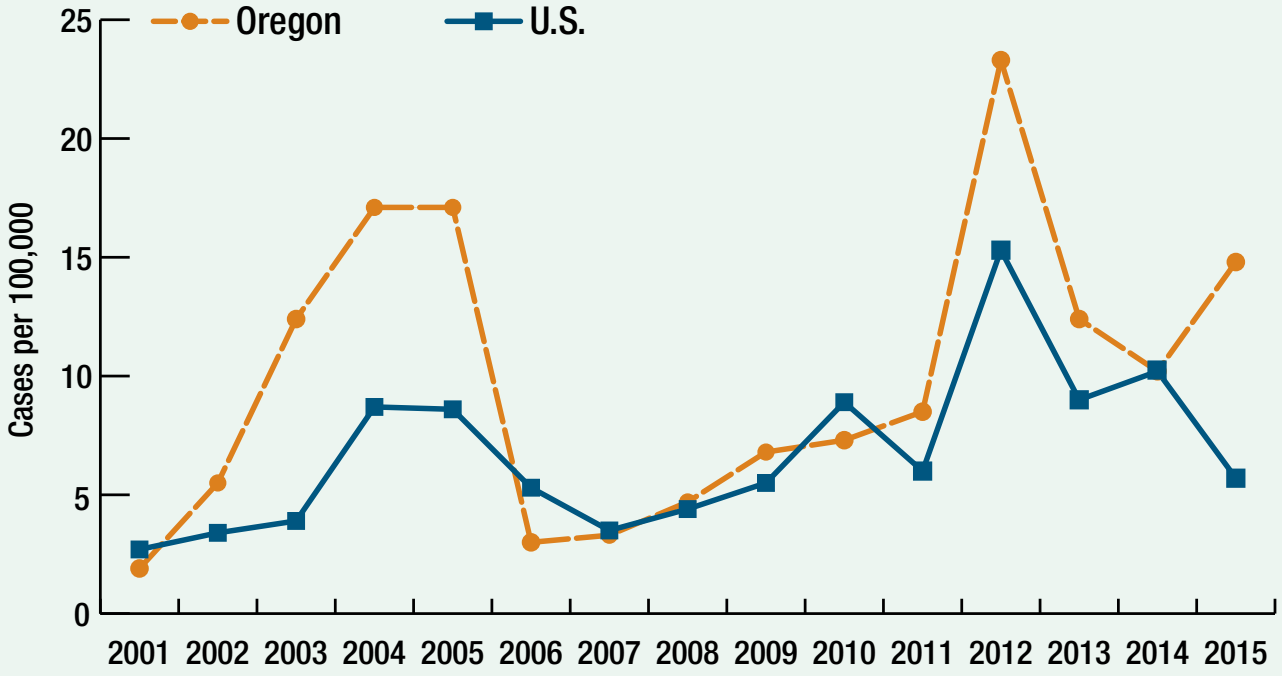
Pertussis by onset month: Oregon, 2015



Incidence of pertussis by age and sex: Oregon, 2015

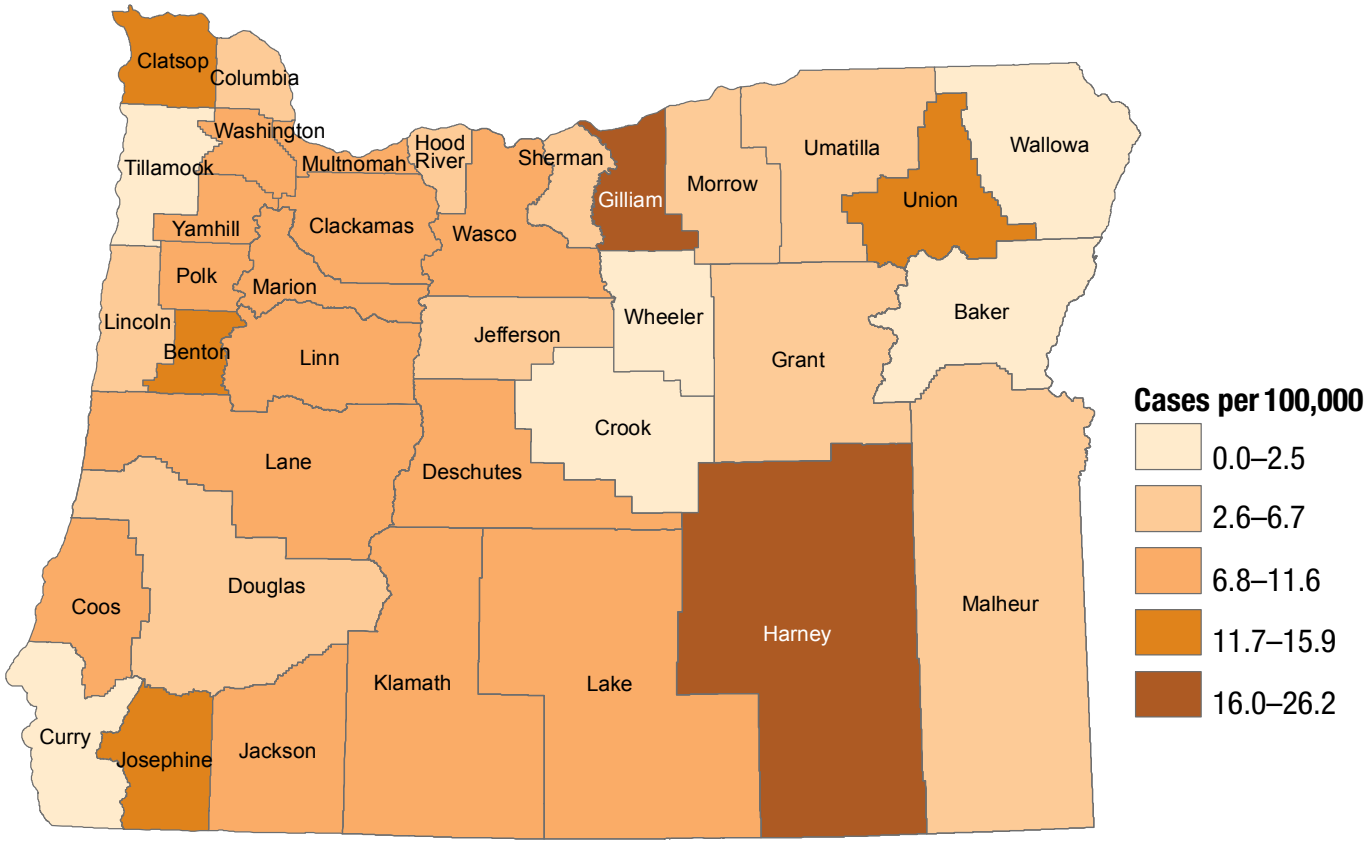


Incidence of pertussis: Oregon vs. nationwide, 2001–2015



Oregon	1.9	5.5	12.4	17.1	17.1	3.0	3.3	4.7	6.8	7.3	8.5	23.3	12.4	10.2	14.8
U.S.	2.7	3.4	3.9	8.7	8.6	5.3	3.5	4.4	5.5	8.9	6.0	15.3	9.0	10.2	5.7

Incidence of pertussis by county of residence: Oregon, 2006–2015



Prevention

- Immunization is the best way to prevent pertussis.
- Cover your cough and wash your hands.
- Keep babies away from anyone who is coughing.

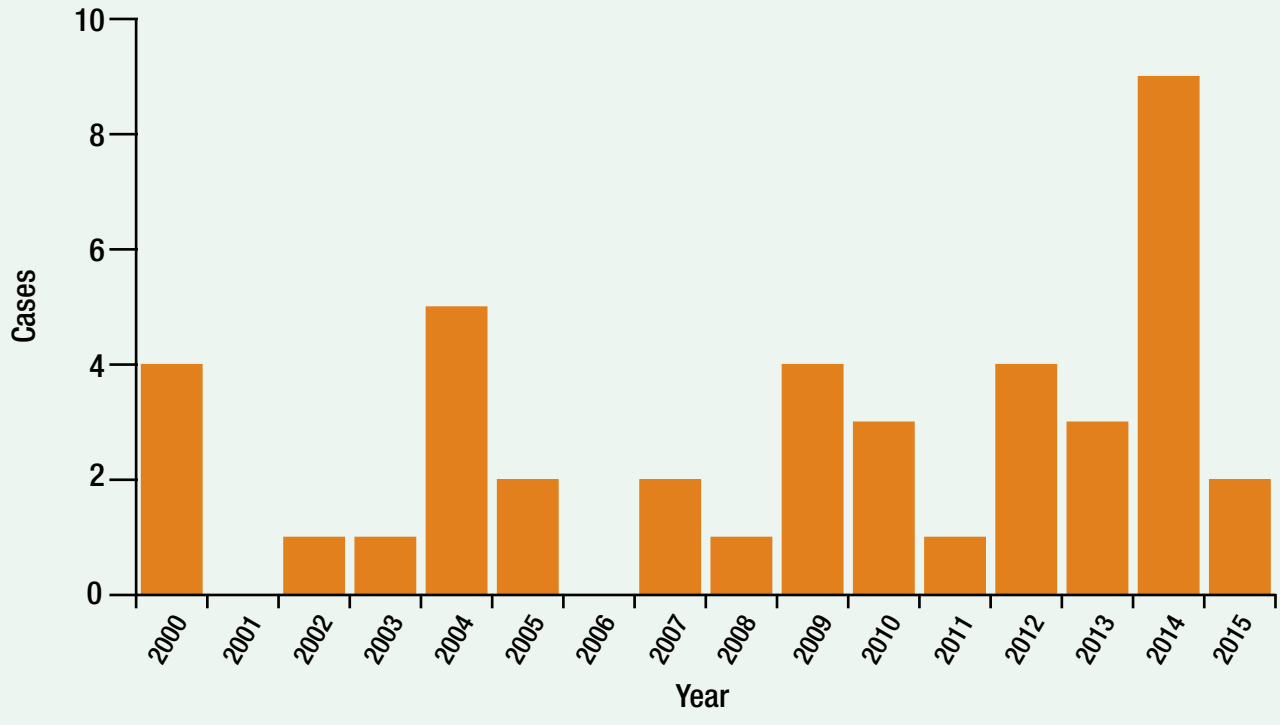
Q fever

Q fever is a bacterial infection caused by *Coxiella burnetii*. It can result in acute or chronic illness in humans, and is usually acquired through inhalation of barnyard dust contaminated with bacteria from the placentas, body fluids or excreta from infected animals. The primary reservoirs are cattle, sheep and goats. Infection may also result from consumption of unpasteurized milk.

Acute Q fever can be accompanied by a host of symptoms, including high fever, severe headache, malaise, myalgia, chills, sweats, nausea, vomiting, dry cough, diarrhea, abdominal pain and chest pain. Most people recover from acute Q fever, but some (<5%) develop chronic illness, which often manifests as endocarditis. Chronic infection can be treated with long courses of antibiotics. Outbreaks in the U.S. have been the result of occupational exposure to infected livestock.

Q fever reports are rare in Oregon; in 2015 two acute cases were reported.

Q fever by year: Oregon, 2000–2015



Prevention

- Barns and laboratories housing potentially infected animals should have restricted access, and holding facilities for sheep should be located away from populated areas.
- Appropriately dispose of placenta, birth products, fetal membranes and aborted fetuses at facilities housing sheep and goats.
- Use only pasteurized milk and milk products.
- Quarantine imported animals.

Rabies

Rabies is an acute infection of the central nervous system caused by a neurotropic rhabdovirus of the genus *Lyssavirus*. All mammals, including humans, are susceptible to rabies. In humans, rabies causes a rapidly progressive and fatal encephalomyelitis. The incubation period in humans is usually 2–12 weeks, but there have been documented incubation periods as long as seven years. Bites from infected animals constitute the primary route of transmission. Transplanted organs, including corneas from patients with undiagnosed rabies, have also caused infection in recipients.

The Pacific Northwest is considered to be free of terrestrial rabies. In Oregon, the main reservoir of rabies is bats. Mammals like foxes and cats may come in contact with rabid bats, acquire the infection and be capable of transmitting it to humans. Since 2000, 9% of the bats tested in Oregon have been positive for rabies. This, of course, is not a random sample of Oregon's bats; rather it represents bats that were neurologically impaired enough to have bitten humans or their pets, and then to have been captured. Any contact between a bat and a human should be evaluated carefully and immediately. All potential human exposures should result in a call to a local public health department office. Testing of an exposing mammal involves killing the animal, removing the head, and sending it to a laboratory for special staining and microscopic examination of brain tissue. The Oregon State Public Health Laboratory will test mammals involved in bona fide human exposures at no cost to the patient; and (for a fee) the Oregon State University's Veterinary Diagnostic Laboratory will test mammals involved in other exposures.

Eighteen bats, one cat, and one fox tested positive in 2015. The positive cat resided in Curry County. Rabies in humans is 100% preventable through prompt appropriate medical care, beginning with thorough cleaning of the wound. Persons not previously immunized for rabies, who are exposed to a rabid animal, should be given human rabies immune globulin (HRIG), with as much as possible infiltrated into and around the bite wound(s), and the rest administered intramuscularly; and four doses of rabies vaccine, one each on days 0, 3, 7 and 14. Before 2008, a five-dose vaccine regimen was recommended. However, review of serologic and case data indicated four doses of vaccination in combination with HRIG elicited a protective immune response and a fifth dose of vaccine provided no additional benefit.

Though bats are the reservoir for rabies in Oregon, canine rabies still accounts for most human rabies cases worldwide. Travelers to rabies-enzootic countries should be warned to seek immediate medical care if they are bitten by any mammal.

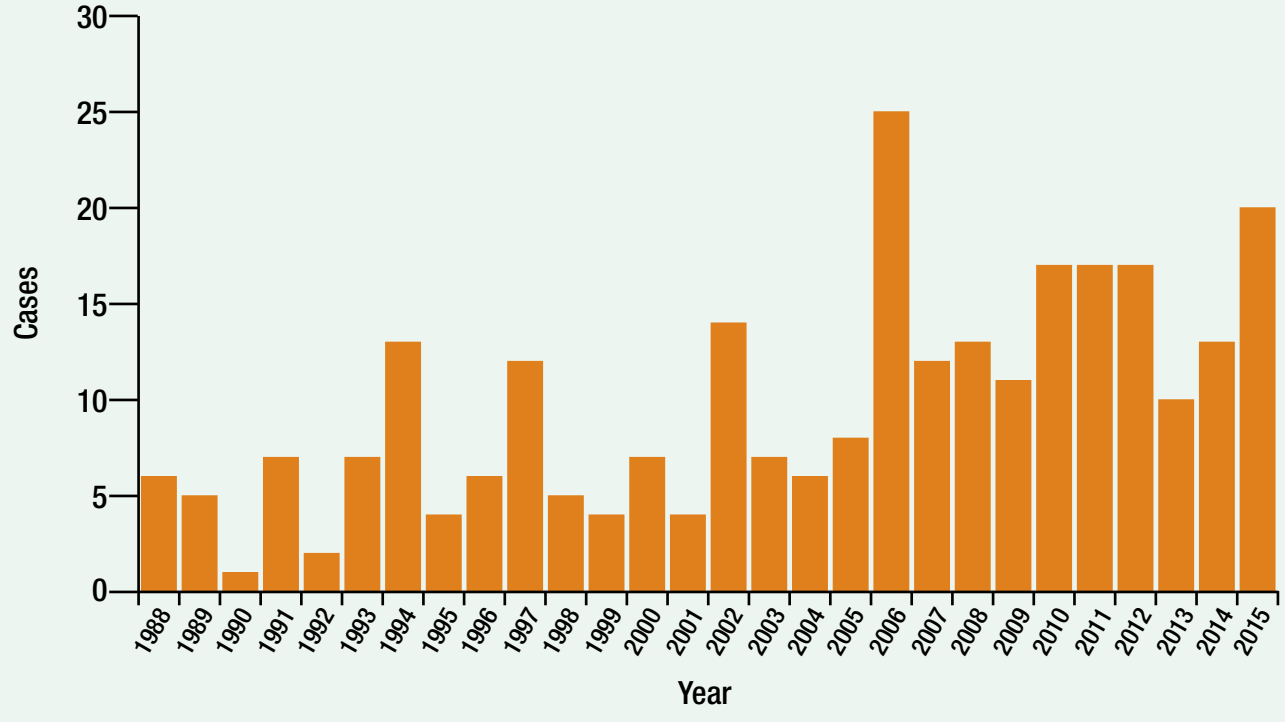
Additional information and an algorithm to follow for assessment of rabies risk are provided here.

Rabies tests in Oregon, 2000–2015 (number of positive/total tested)

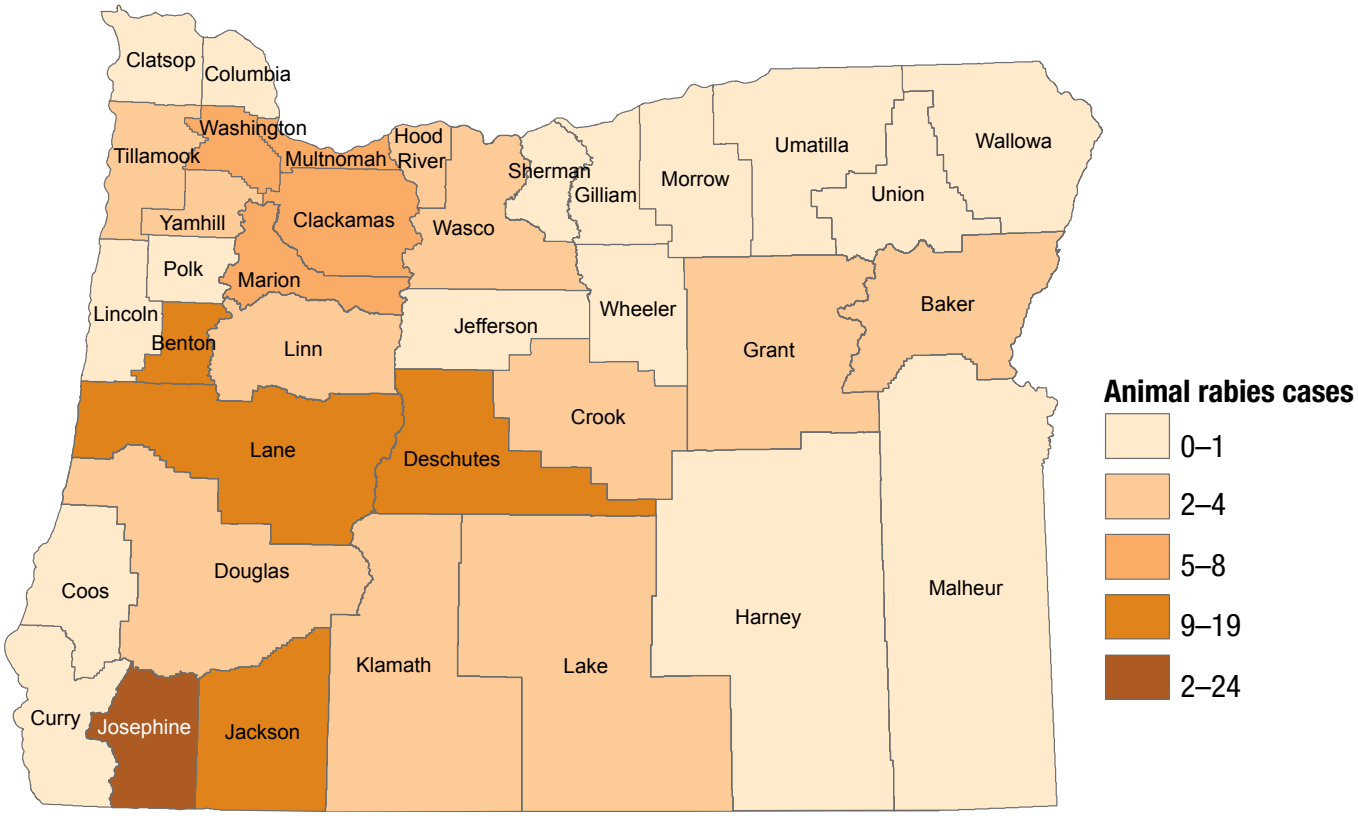
Year	Bat	Cat	Dog	Fox	Other
2000	8/73	0/79	0/56	1/4	0/4
2001	4/59	0/67	0/46	0/1	0/41
2002	12/134	0/102	0/27	2/4	0/29
2003	6/61	0/75	0/36	1/5	0/39
2004	8/83	0/100	0/48	0/1	0/23
2005	23/126	0/72	0/26	2/4	0/41
2006	12/153	0/80	0/33	0/1	0/26
2007	13/128	0/58	0/23	0/3	0/53
2008	8/83	0/100	0/48	0/1	0/23
2009	11/117	0/73	0/27	0/1	0/42
2010	10/104	0/67	0/41	6**/15	1/48 (goat)
2011	11/143	0/86	0/32	5**/44	1**/61 (coyote)
2012	14/203	0/79	0/37	3**/28	0/45
2013	7/193	0/90	0/36	2/34	1/53 (coyote)
2014	10/148	0/79	0/39	3/7	0/31
2015	18/219	1/89	0/39	1/4	0/37
Totals 2000–2015	**174/2032 8.6 %**	**1/1299 0.08%**	**0/588**	**26/158 16.5%**	**3/600 0.5%**

** enhanced surveillance due to positive goat and foxes in 2010–12

Animal rabies by year: Oregon, 1988–2015



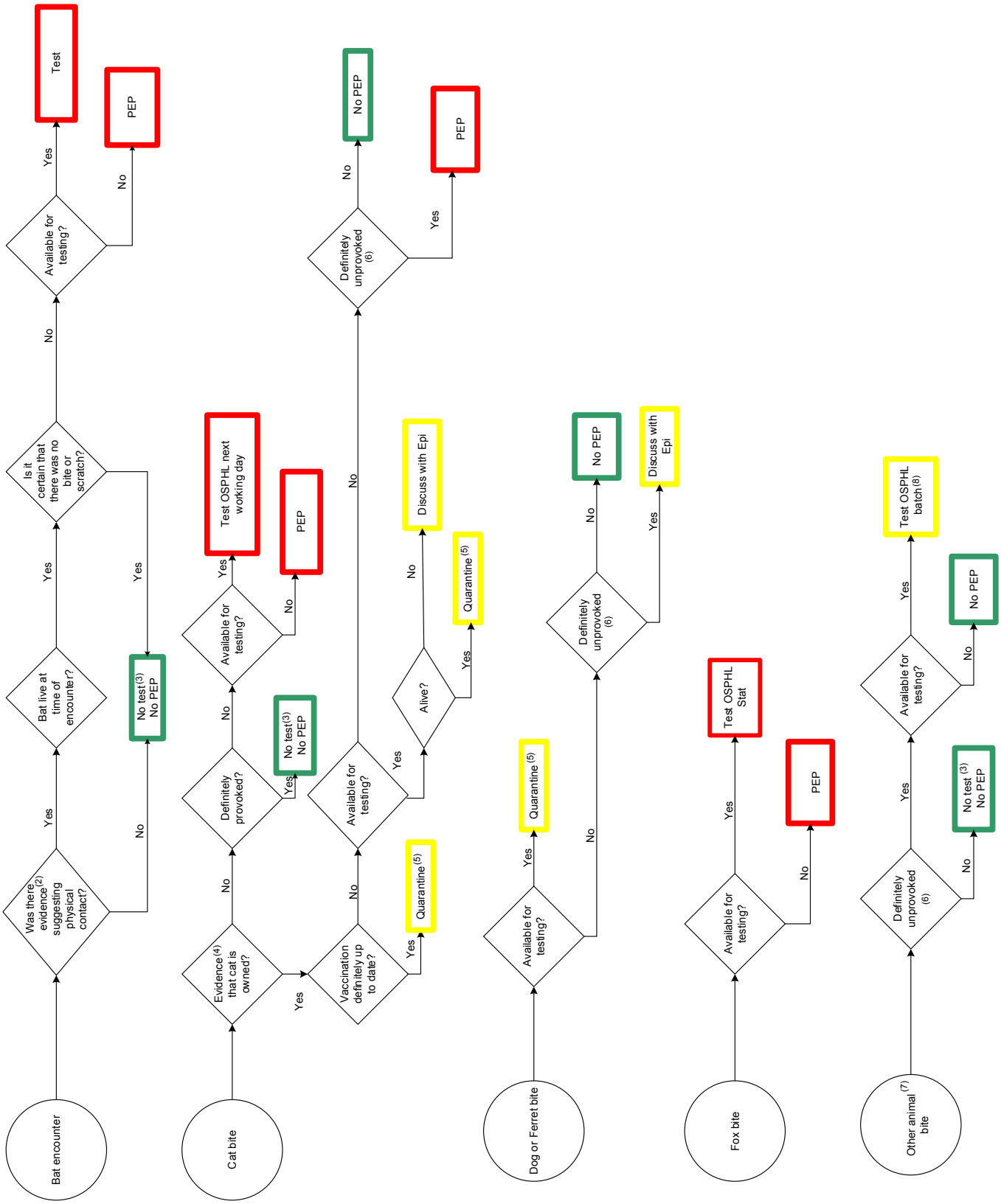
Animal rabies cases by county of residence: 2006–2015



Prevention

- Keep rabies vaccinations up to date for all pet cats, ferrets and dogs.
- Maintain control of pets by keeping cats and ferrets indoors and keeping dogs under direct supervision.
- Spay or neuter pets to help reduce the number of unwanted pets that may not be properly cared for or vaccinated regularly.
- Call animal control to remove stray animals from your neighborhood because these animals may be unvaccinated or ill.
- Do not handle wildlife, especially bats and foxes.

Algorithm for prevention of rabies after animal encounter in Oregon[1]



Algorithm for prevention of rabies after animal encounter in Oregon notes

Notes

1. Oregon law mandates reporting of any bite of a human being by any other mammal (Oregon Administrative Rule 333-018-0015[5] [c]); such reports should be made to the local public health authority for the jurisdiction in which the patient resides. Decisions about rabies PEP are the purview of the clinician attending the patient; although these recommendations regarding the need for rabies PEP represent the best judgment of state public health officials, they are not binding on clinicians. Clinicians should be advised that, aside from concern about rabies, prophylaxis against tetanus or bacterial infection might be warranted, depending on the nature of the wound and the animal involved. Local health department personnel are advised to call Acute and Communicable Disease Prevention at 971-673-1111 with specific questions regarding application of these guidelines.
2. Such evidence might include, e.g., a young child's waking up, crying, with a bat found in the room.
3. "No Test" means that the animal will not be tested at OSPHL, at state expense. In such cases, the animal may be tested at the Oregon State University Veterinary Diagnostics Laboratory (541-737-3261) at private expense.
4. Evidence of ownership might include, e.g., presence of collar or previous appearances of the animal in a neighborhood.
5. "Quarantine" means confining a dog, cat or ferret for 10 days to observe for signs of illness after biting a human being. The nature of the confinement is determined by the local public health authority. If the animal develops neurological illness during the period of quarantine, it should be euthanized and its head shipped to OSPHL for testing within one working day.
6. "Unprovoked" implies that in the context of the situation there was no obvious alternative motivation for the animal to bite. A good history is essential. In practice, unprovoked bites are quite rare. Examples of provocation would include being hit by a car, being handled, fed or caged; being cornered in a garage, having a jogger run past your yard or crowding animal's space, etc.
7. For purposes of determining need for rabies PEP, wolf-hybrids are considered wild animals and not dogs. Wolf-dog hybrids that bite or otherwise expose persons, pets, or livestock should be considered for euthanasia and rabies examination. Whether an animal is a dog or a wolf-dog hybrid must be determined by a licensed veterinarian, subject to review by the State Public Health Veterinarian or designee (OR 333-019-0022).
8. Batch testing for rabies is generally done at OSPHL on Mondays and Wednesdays. Results are available the following day.

Abbreviations:

OSPHL:	Oregon State Public Health Laboratory
PEP:	Post-Exposure Prophylaxis against rabies
Epi	Epidemiologists at the Oregon Health Authority; Weekdays, nights and weekends (971-673-1111)

Salmonellosis

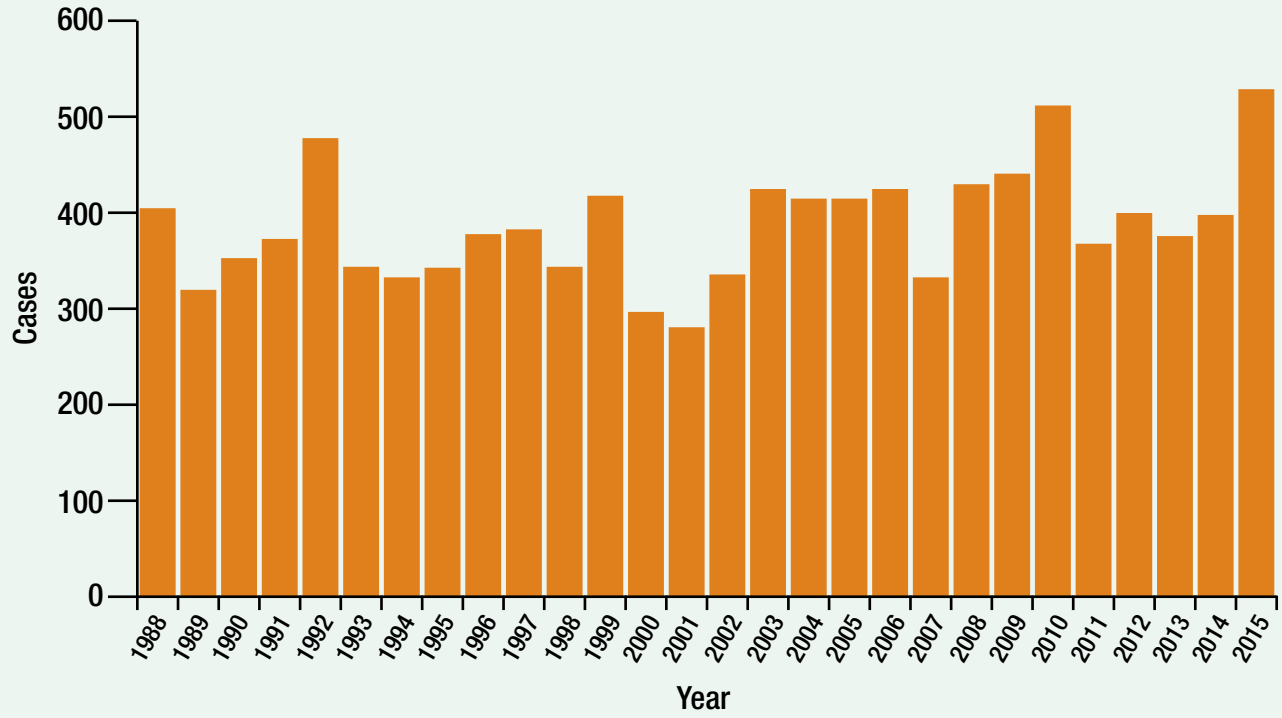
Salmonellosis is a bacterial illness characterized by acute abdominal pain, diarrhea and often fever that usually begins one to five days after exposure. Excretion of *Salmonella* may persist for several days or even months beyond the acute phase of illness. Antibiotics are not needed by most patients (the exceptions being those at high risk of invasive infection), and they may increase the duration of excretion.

A wide range of domestic and wild animals are carriers of *Salmonella*, including poultry, swine, cattle, rodents, iguanas, tortoises, turtles, snakes, young poultry, dogs and cats. Most human infections are thought to come from consumption of fecally contaminated food or water, but other environmental exposures may be hard to document and therefore underappreciated. Raw or undercooked produce and products of animal origin — such as eggs, milk, meat and poultry — have been implicated as common sources of animal and human salmonellosis. Though not as common as *Escherichia coli* O157 infection, person-to-person transmission of salmonellosis is well documented. The incidence of reported infection is highest among children <5 years of age. In 2015, Oregon's incidence among children <5 years was 25.6 per 100,000.

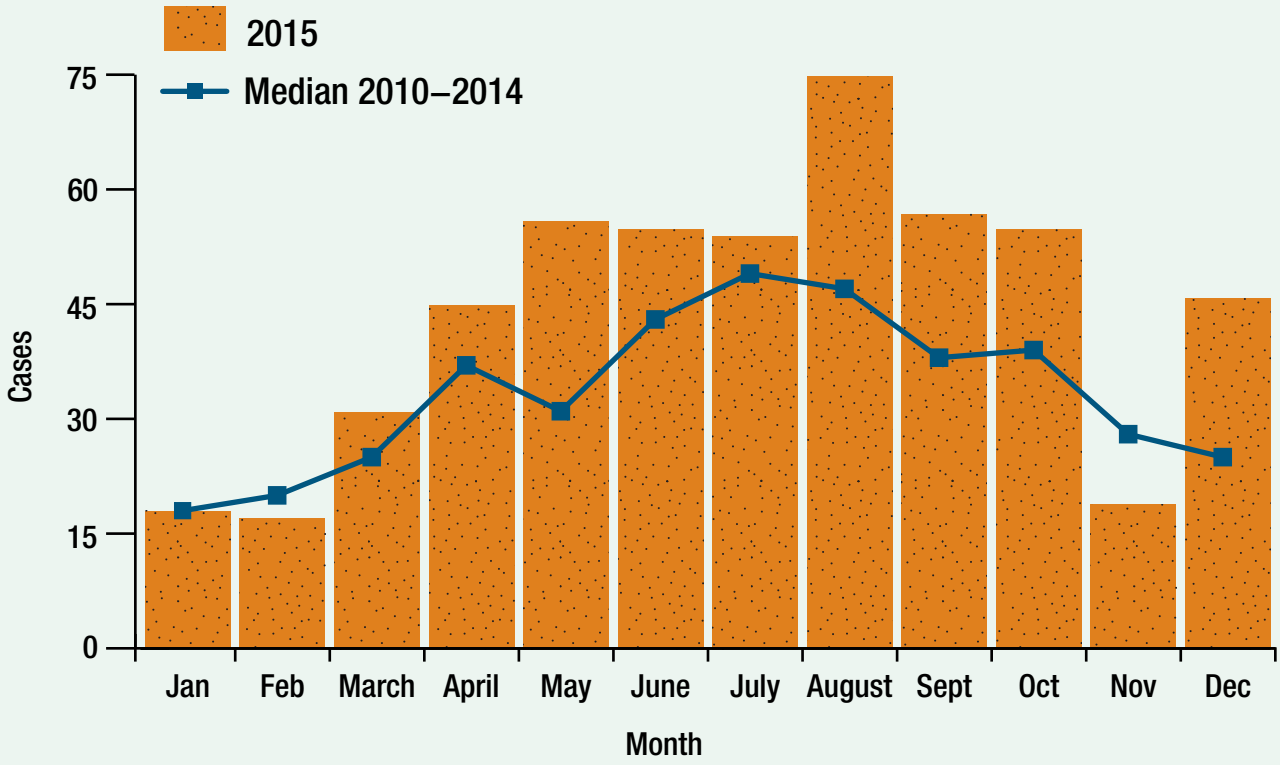
Of approximately 2,500 known serotypes, only about 200 are detected in the United States in any given year. In Oregon, *S.* Enteritidis and *S.* Typhimurium have historically been the two most commonly reported serotypes, comprising 26% and 15% of all lab-confirmed isolates in 2015, respectively. Sixty-one percent of cases were sporadic, 14% associated with an outbreak, and 4% documented transmission within a household.

In 2015, 528 salmonellosis cases were reported in Oregon. Thirteen outbreaks of salmonellosis were reported. These outbreaks accounted for 72 cases. One large outbreak with 23 Oregon cases involved cucumbers imported from Baja California. Nationally there were >800 cases. Another involved a food vendor at a conference. Smaller outbreaks involved raw egg nog, sprouted nut butter, and pork. In total, eight outbreaks were foodborne, three were associated with animal contact (turtles, live poultry), despite investigation, two others remained indeterminate.

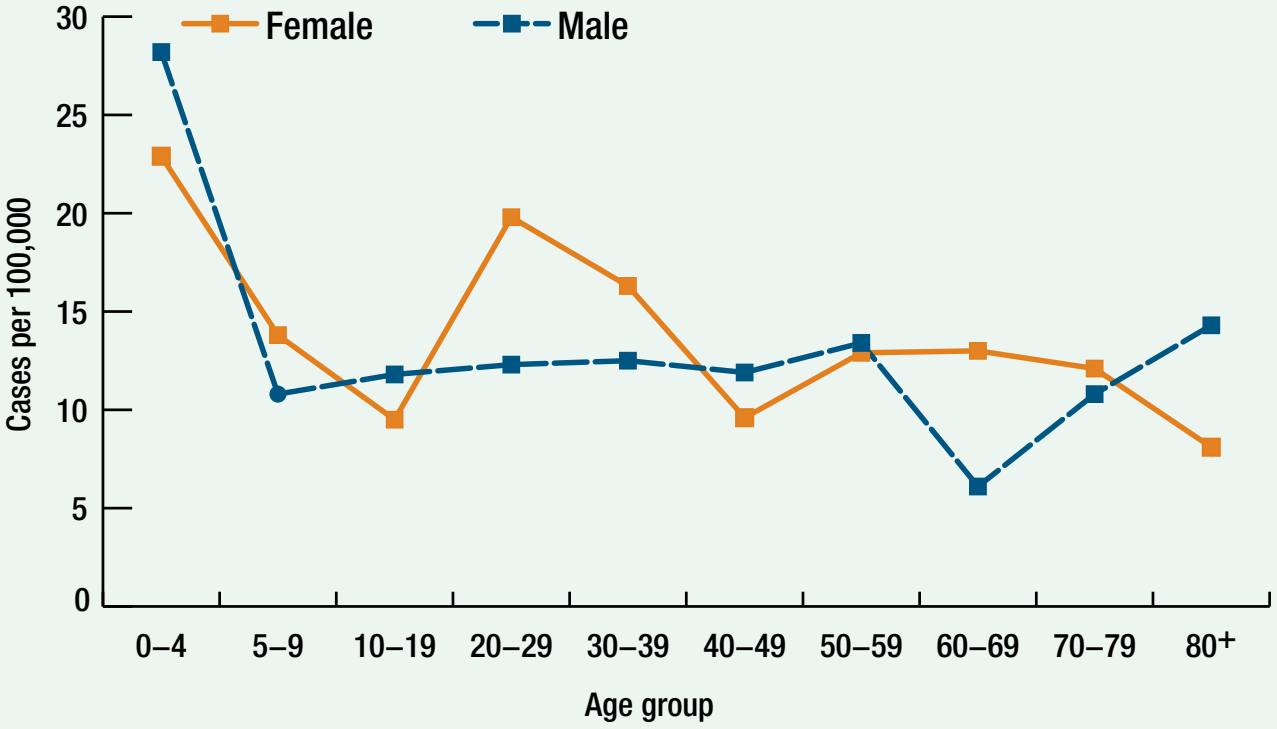
Salmonellosis by year: Oregon, 1988–2015



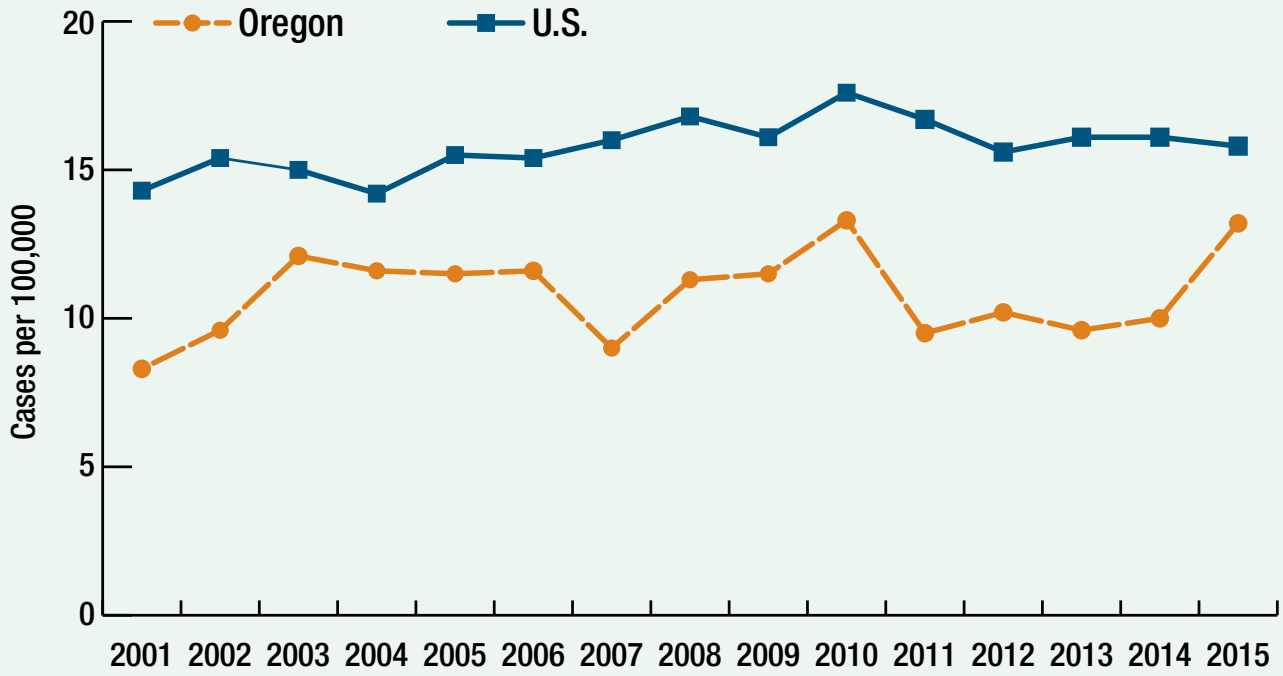
Salmonellosis by onset month: Oregon, 2015



Incidence of salmonellosis by age and sex: Oregon, 2015

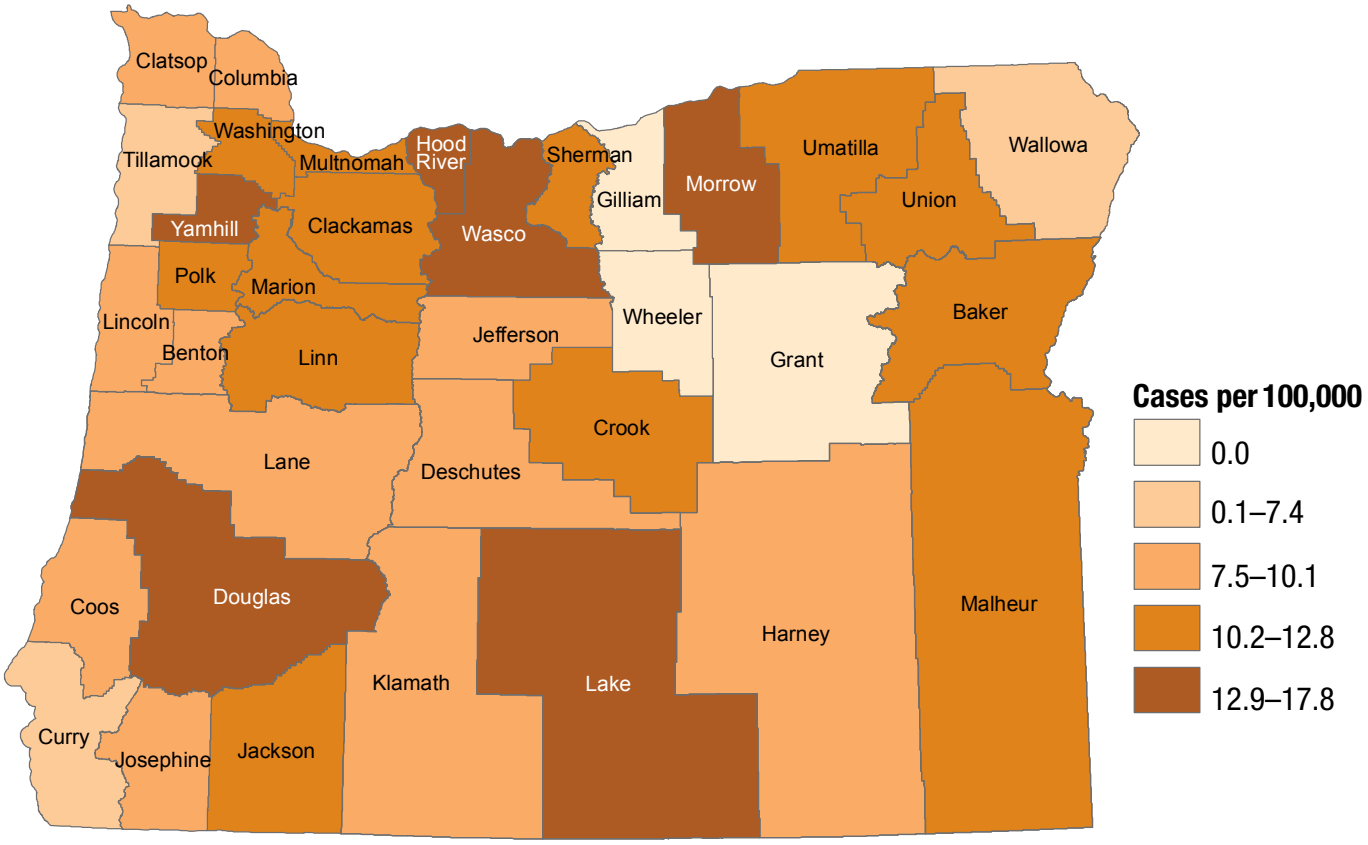


Incidence of salmonellosis: Oregon vs. nationwide, 2001–2015



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	8.3	9.6	12.1	11.6	11.5	11.6	9.0	11.3	11.5	13.3	9.5	10.2	9.6	10.0	13.2
U.S.	14.3	15.4	15.0	14.2	15.5	15.4	16.0	16.8	16.1	17.6	16.7	15.6	16.1	16.1	15.8

Incidence of salmonellosis by county of residence: Oregon, 2015



Selected* salmonellosis cases by serotype, Oregon, 2006–2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Braenderup	11	8	1	21	36	9	10	7	12	9
Enteritidis	74	50	75	61	123	67	74	80	103	128
Hadar	5	1	3	7	8	7	11	6	4	14
Heidelberg	19	26	24	44	28	13	57	23	21	8
Infantis	7	5	8	9	9	13	15	10	6	11
Javiana	5	1	1	1	10	2	4	4	5	10
Montevideo	13	12	16	22	12	17	13	5	4	20
Muenchen	8	9	9	10	9	5	5	3	5	8
Newport	16	17	15	15	24	13	8	15	18	14
Oranienburg	5	8	8	6	8	11	8	9	12	13
Poona	4	2	7	2	0	2	3	3	2	29
Saintpaul	10	3	23	10	13	8	3	12	10	19
Thompson	9	4	5	12	14	14	9	12	18	6
Typhimurium	88	52	65	81	53	47	50	82	61	80
I 4,[5],12:i:-	20	28	9	11	8	9	9	18	22	40

*Selected because at least one case was reported in 2015 and it is a more common serotype.

Prevention

- Cook poultry, ground beef and eggs thoroughly.
- Do not eat or drink foods containing raw eggs or raw (unpasteurized) milk.
- If you are served undercooked meat, poultry or eggs in a restaurant, send it back to the kitchen for further cooking.
- Wash hands, kitchen work surfaces, and utensils with soap and warm water immediately after they have been in contact with raw meat or poultry.
- Be particularly careful with foods prepared for infants, the elderly and the immunocompromised.
- Wash hands with soap and warm water after handling reptiles, birds or baby chicks, and after contact with pet feces.
- Avoid direct or even indirect contact between reptiles (turtles, iguanas, other lizards, snakes) and infants or immunocompromised persons.
- Don't work with raw poultry or meat, and an infant (e.g., feed, change diaper) at the same time.

Shigellosis

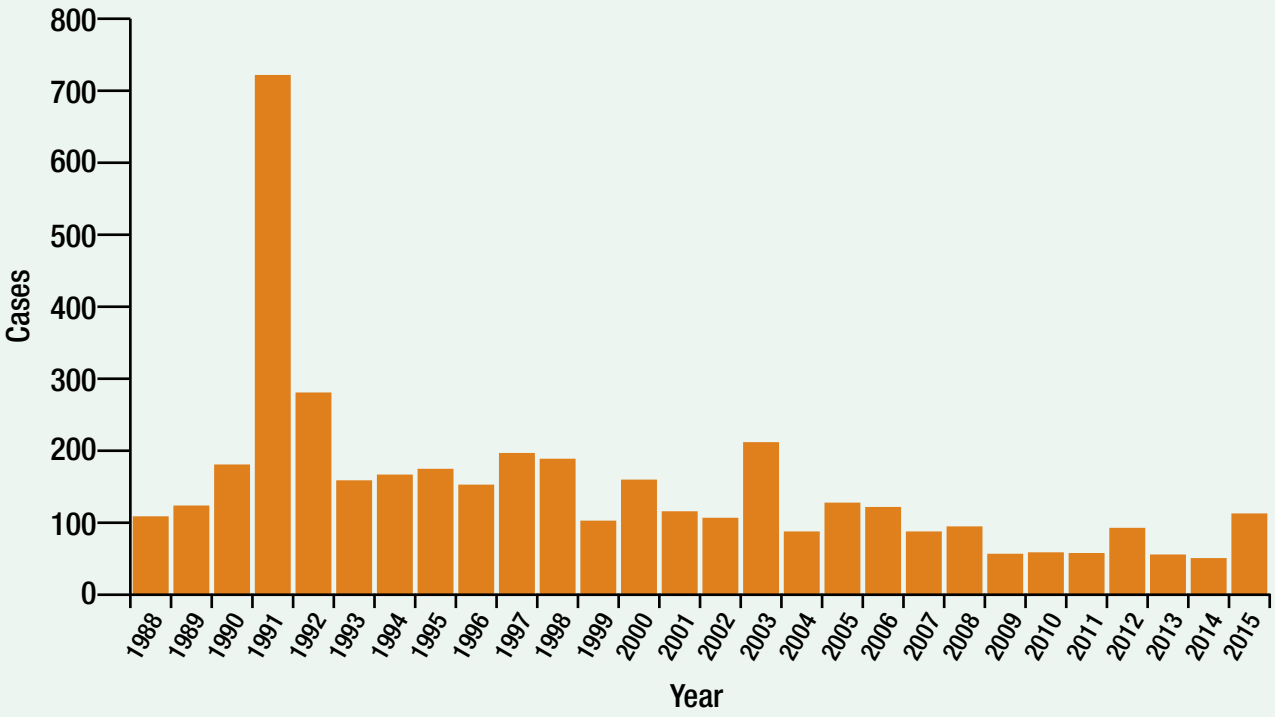
Shigellosis is an acute bacterial infection characterized by (sometimes bloody) diarrhea, vomiting, abdominal cramps and, often, fever. In Oregon, shigellosis is typically caused by *S. sonnei or S. flexneri*. The other species — *S. boydii* and *S. dysenteriae* — are more common in developing countries. Humans are the only known reservoir. Shigellosis is transmitted from person to person, and just a few organisms can cause illness. The rate has historically been highest among children 1–4 years of age. The incidence of shigellosis typically peaks in late summer and fall. Treatment reduces duration of illness, but the organism has become resistant to many antibiotics used for empiric therapy. Testing for antibiotic susceptibility is important for treatment.

Outbreaks in daycare centers are common, mainly due to the poor hygienic practices of small children. Hand washing is the most important means of prevention. One school associated outbreak occurred in Oregon in 2015.

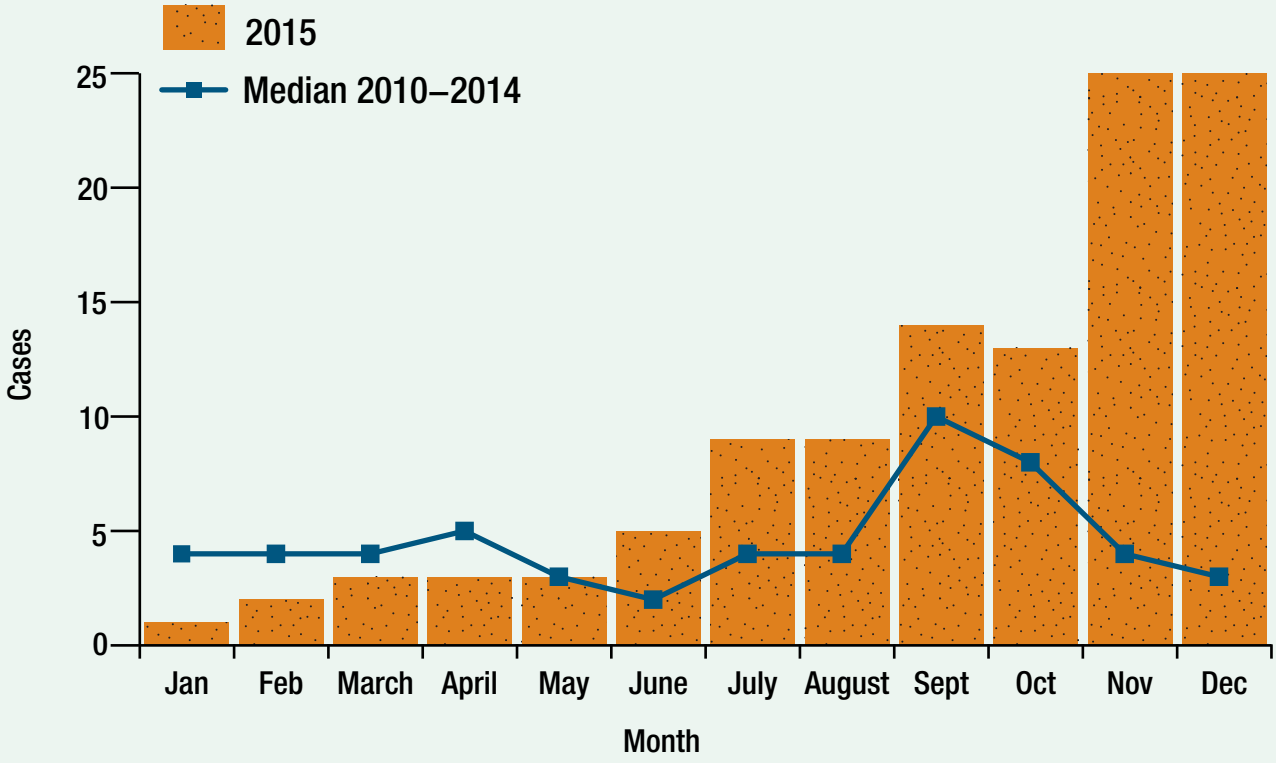
After being a historic low in 2014, the number of cases jumped to 112 in 2015. This was mainly driven by an outbreak which started among men who have sex with men and spread among the homeless population. There were 59 (53%) cases associated with the outbreak. The outbreak continued for several months before it subsided. The overwhelming majority of cases have occurred among men.

Of the 112 cases, 87 (78%) were *S. sonnei* and 19 (17%) were *S. flexneri*.

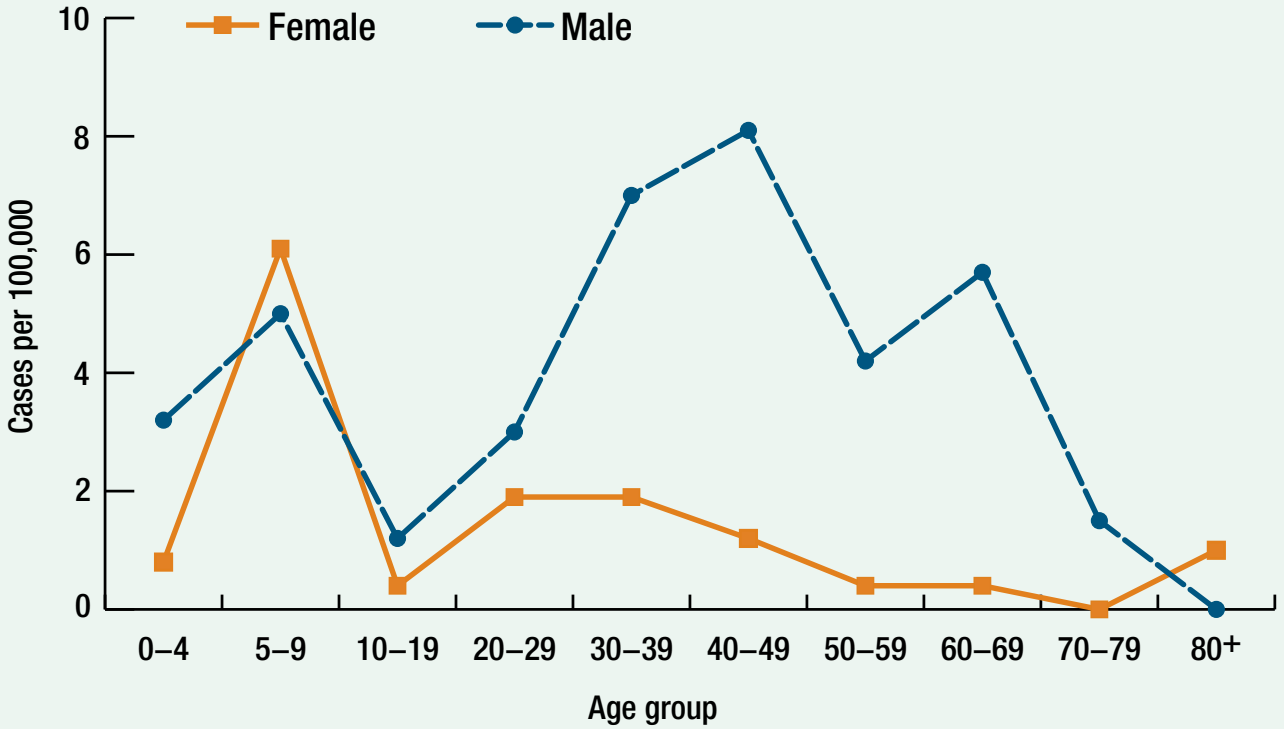
Shigellosis by year: Oregon, 1988–2015



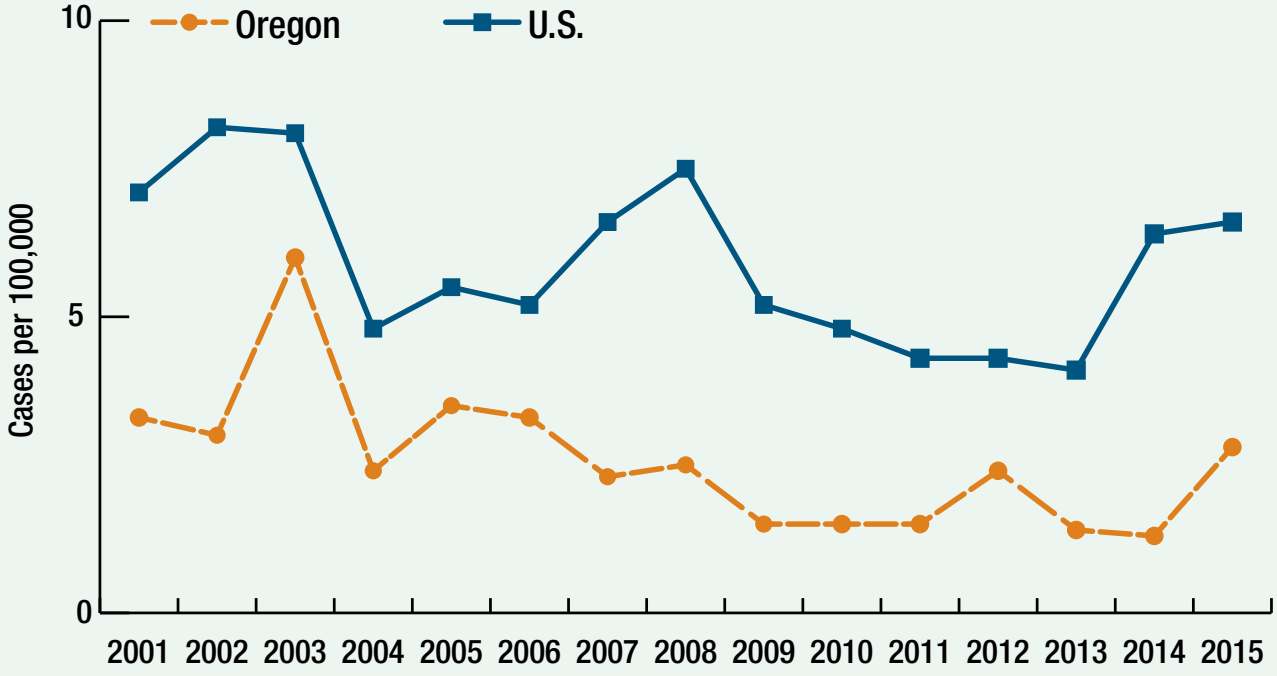
Shigellosis by onset month: Oregon, 2015



Incidence of shigellosis by age and sex: Oregon, 2015

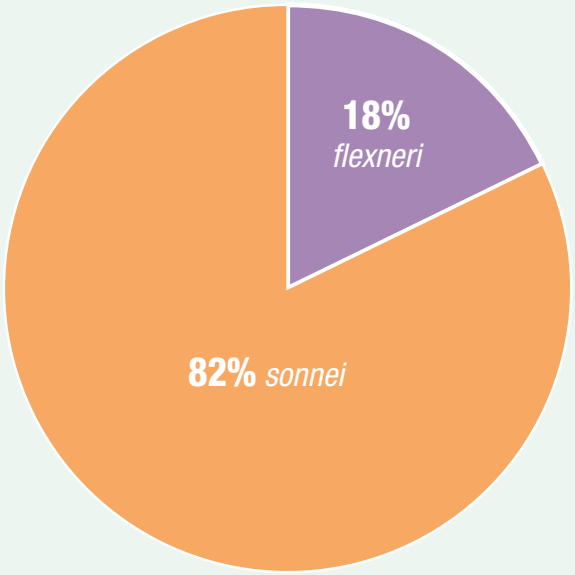


Incidence of shigellosis: Oregon vs. nationwide, 2001–2015

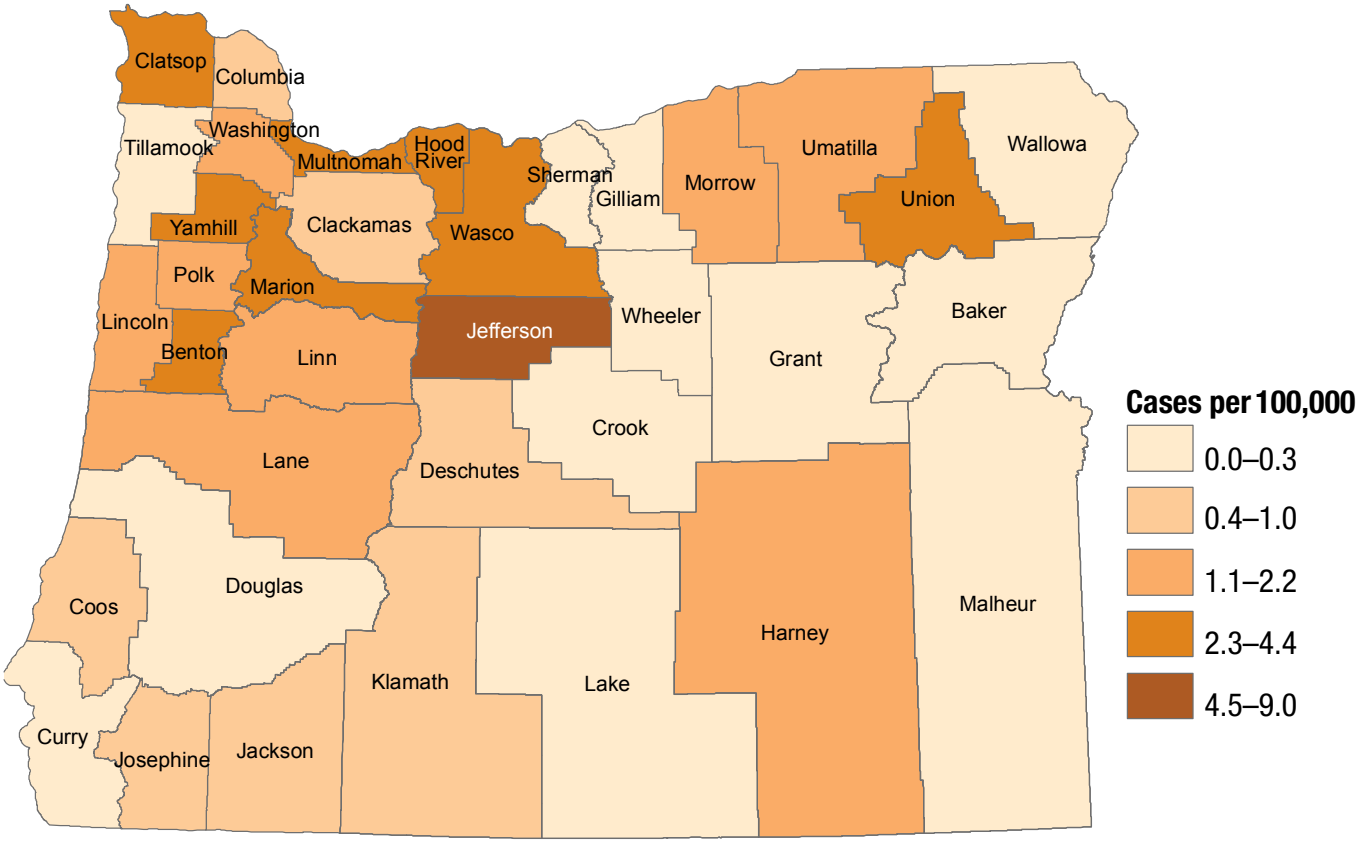


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oregon	3.3	3.0	6.0	2.4	3.5	3.3	2.3	2.5	1.5	1.5	1.5	2.4	1.4	1.3	2.8
U.S.	7.1	8.2	8.1	4.8	5.5	5.2	6.6	7.5	5.2	4.8	4.3	4.3	4.1	6.4	6.6

Shigellosis by species: Oregon, 2015



Incidence of shigellosis by county of residence: Oregon, 2006–2015



Prevention

- Wash hands with soap and warm water carefully and frequently, especially after going to the bathroom, after changing diapers, and before preparing food or beverages.
- Dispose soiled diapers properly.
- Disinfect diaper changing areas after using them.
- Keep children with diarrhea out of child care settings.
- Supervise hand washing of toddlers and small children after they use the toilet.
- Do not prepare food for others while ill with diarrhea.
- Avoid swallowing water from ponds, lakes or untreated pools.

Tularemia

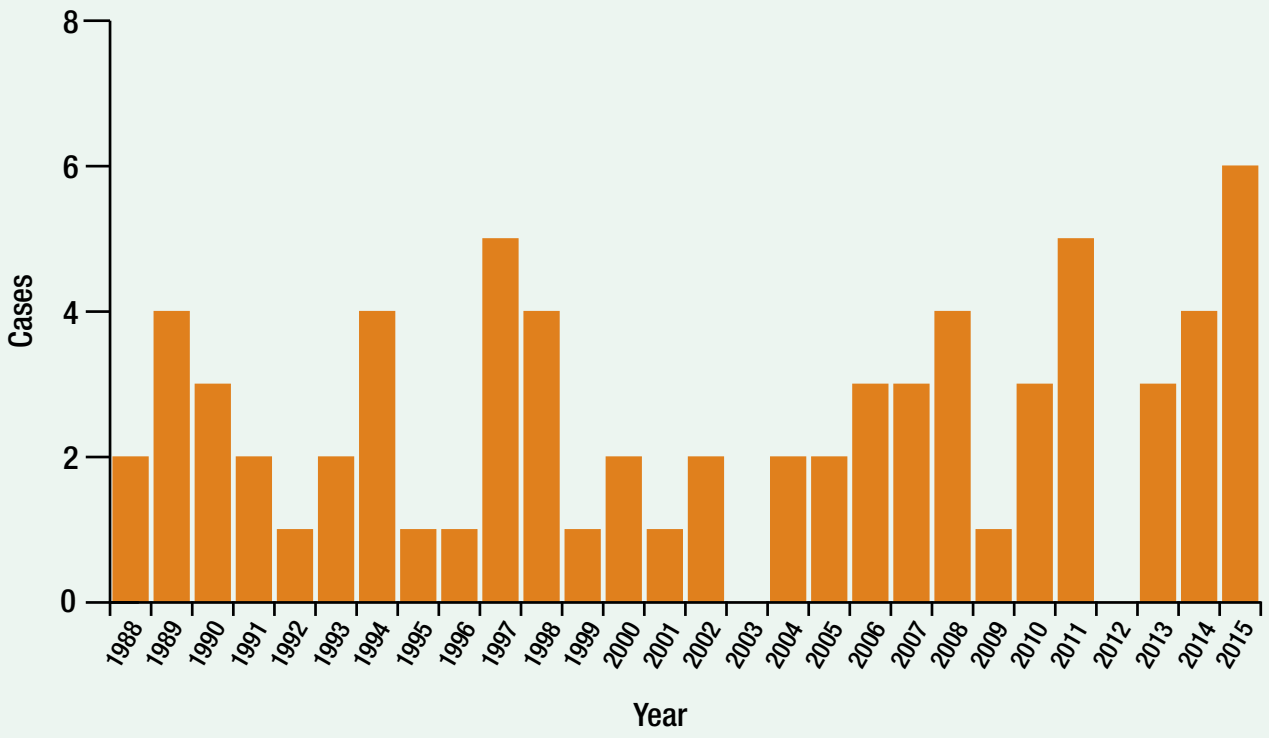
Tularemia, also known as rabbit or deer-fly fever, is considered a "category A" agent of potential bioterrorism. It is caused by *Francisella tularensis,* a hardy organism found in rodents, rabbits and squirrels; in ticks, deer flies and mosquitoes; and in contaminated soil, water and animal carcasses. The organism is remarkably infective; as few as 10–50 organisms can cause disease.

Tularemia occurs throughout the United States. Persons become infected primarily through handling contaminated animals; the bite of infective deer flies, mosquitoes or ticks; direct contact with or ingestion of contaminated food, water or soil; or inhalation of infective aerosols. *Francisella tularensis* is highly infectious when grown in culture and can be a risk for infection among laboratory workers. For potentially exposed workers, management options include a "fever watch" or antimicrobial prophylaxis.

Disease onset is usually sudden, and includes fever, malaise, myalgia, headache, chills, rigors and sore throat. Tularemia has six clinical forms, depending on the bacterium's portal of entry. Ulceroglandular tularemia is the most common form of the disease, accounting for 75%–85% of naturally occurring cases. Other clinical forms include pneumonic (pulmonary symptoms); typhoidal (gastrointestinal symptoms and sepsis); glandular (regional adenopathy without skin lesion); oculoglandular (painful, purulent conjunctivitis with adenopathy); and oropharyngeal (pharyngitis with adenopathy).

Six sporadic cases were reported in Oregon in 2015.

Tularemia by year: Oregon, 1988–2015



Prevention

Use precautions when hiking, hunting, camping or working outdoors:

- Use insect repellents containing 20%–30% DEET, picaridin or IR3535.
- Wear long pants, long sleeves and long socks to keep ticks and deer flies off your skin.
- Remove attached ticks promptly with fine-tipped tweezers.
- Don't drink untreated surface water.
- Don't run over sick or dead animals with a lawn mower.
- If you hunt, trap or skin animals:
  - › Use gloves when handling animals, especially rabbits, muskrats, prairie dogs and other rodents.
  - › Cook game meat thoroughly before eating.

Laboratory workers should use precautions when working with suspect cultures:

- Procedures that manipulate cultures and might produce aerosols or droplets should be done under biosafety level 3 conditions.

Vibriosis

Vibriosis is caused by infection with bacteria from the *Vibrionaceae* family. This family of bacteria includes the species that causes cholera, and public health investigators typically distinguish between either cholera (infection with toxigenic *V. cholerae*) and other "vibriosis" (infection with any other *Vibrionaceae*, including those vibrios lately rechristened as *"Grimontia"*).

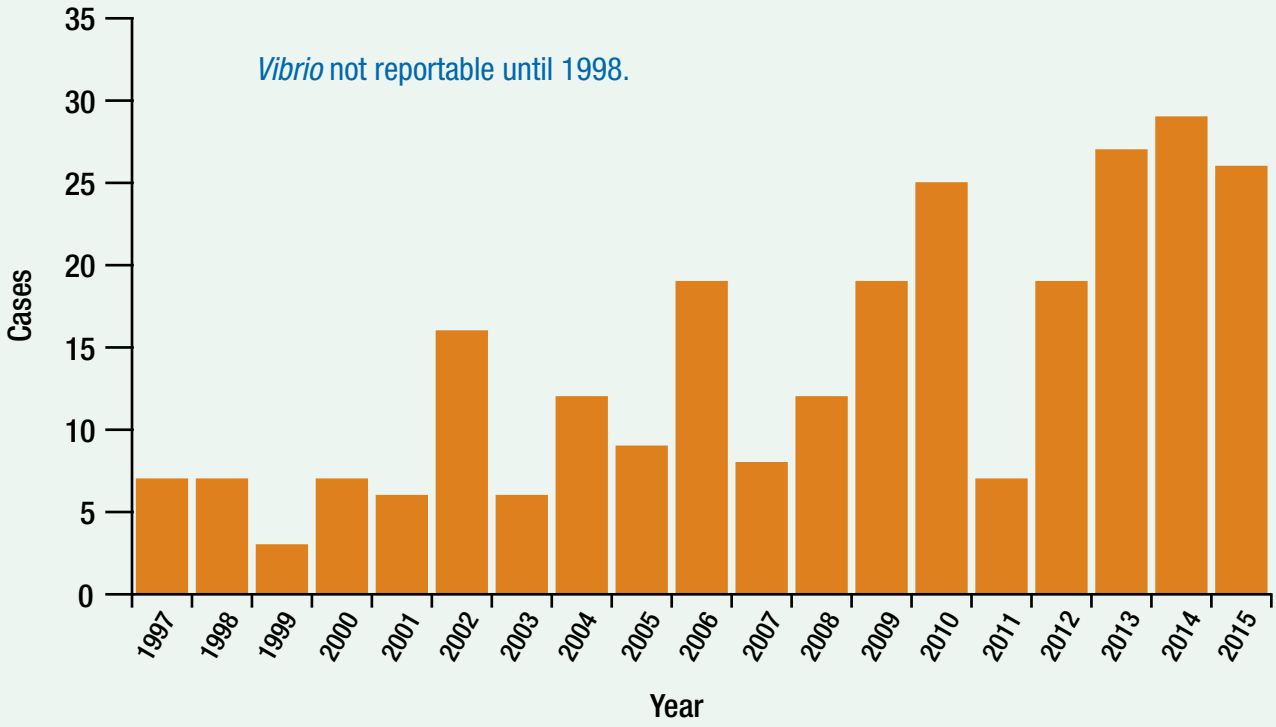
Commonly, vibriosis is acquired by eating raw or undercooked molluscan shellfish and presents as watery diarrhea, abdominal cramps and fever. In Oregon, *V. parahaemolyticus* is the most frequently reported species, as this pathogen is found naturally in the coastal waters and shellfish of the Pacific Northwest, especially during summer months. Non-foodborne infections with *Vibrio* species can also occur through contact with sea or brackish water (e.g., infection with *V. alginolyticus* after swimming with an open wound, or through a laceration while shucking an oyster). These types of infections can produce bullae, cellulitis, muscle pain, fever and sepsis.

Vibriosis was not reportable until 1998 in Oregon and 2007 nationwide. Today, all *Vibrio* infections are nationally notifiable. Case reporting is essential to the identification of contaminated shellfish beds and removal of these shellfish from the raw seafood market. In 2013, the CDC FoodNet Program estimated every reported case of *Vibrio* represents 142 people not diagnosed with the infection.

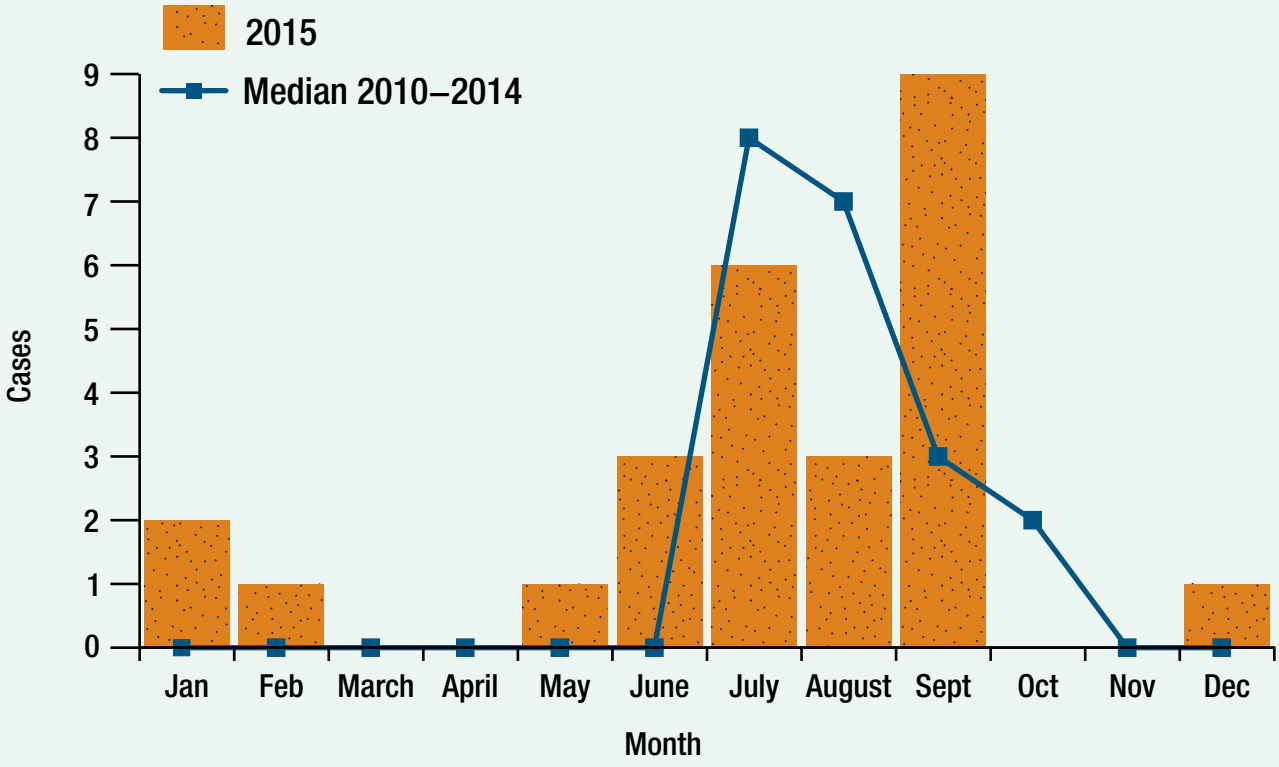
Nationally, reported rates of vibriosis have trended upwards in the past decade. Scientists now believe that *V. parahaemolyticus* is an indicator of climate change; the bug requires temperatures warmer than 59 degrees Fahrenheit to grow and is proliferating in waters that had historically been too cool. With warmer water temperatures in the Pacific Northwest, we can expect more bacteria in the waters and more contamination of shellfish growing in these waters. Close regulation of oyster growers in this region, especially in Washington, has likely decreased the numbers of cases we've seen (by limiting exposure to shellfish when they are thought to be at high risk of *Vibrio* contamination).

In 2015, Oregon saw 26 cases of vibriosis, a decrease from the 29 cases reported in 2014. Males outnumbered females (19 males to 7 females). The majority of cases reported continue to be *V. parahaemolyticus* (21), with one each of *V. alginolyticus, V. mimicus, V. fluvialis*, and *Grimontia hollisae*.

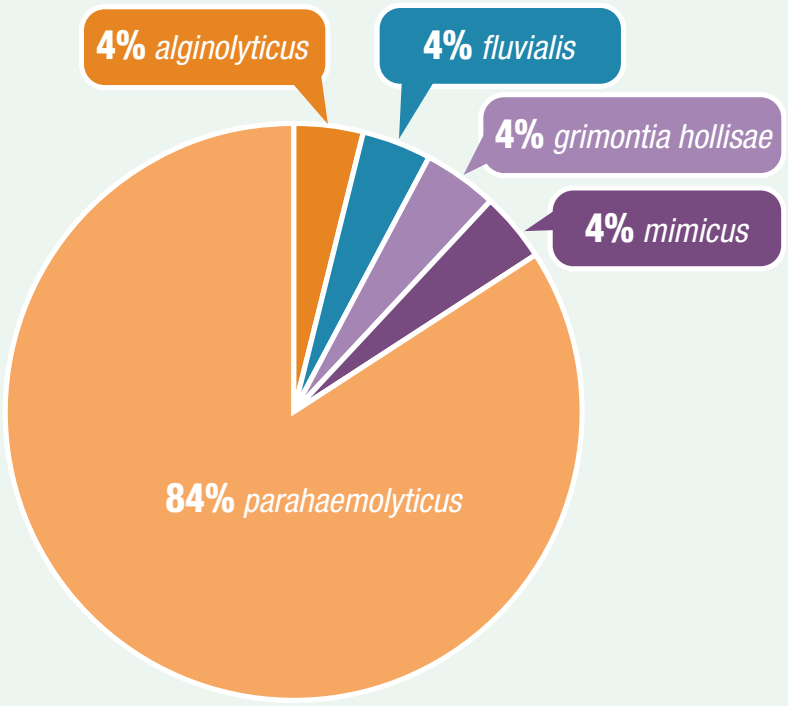
Vibrio infections: Oregon, 1997–2015



Vibriosis by onset month: Oregon, 2015



Vibriosis by species: Oregon, 2015



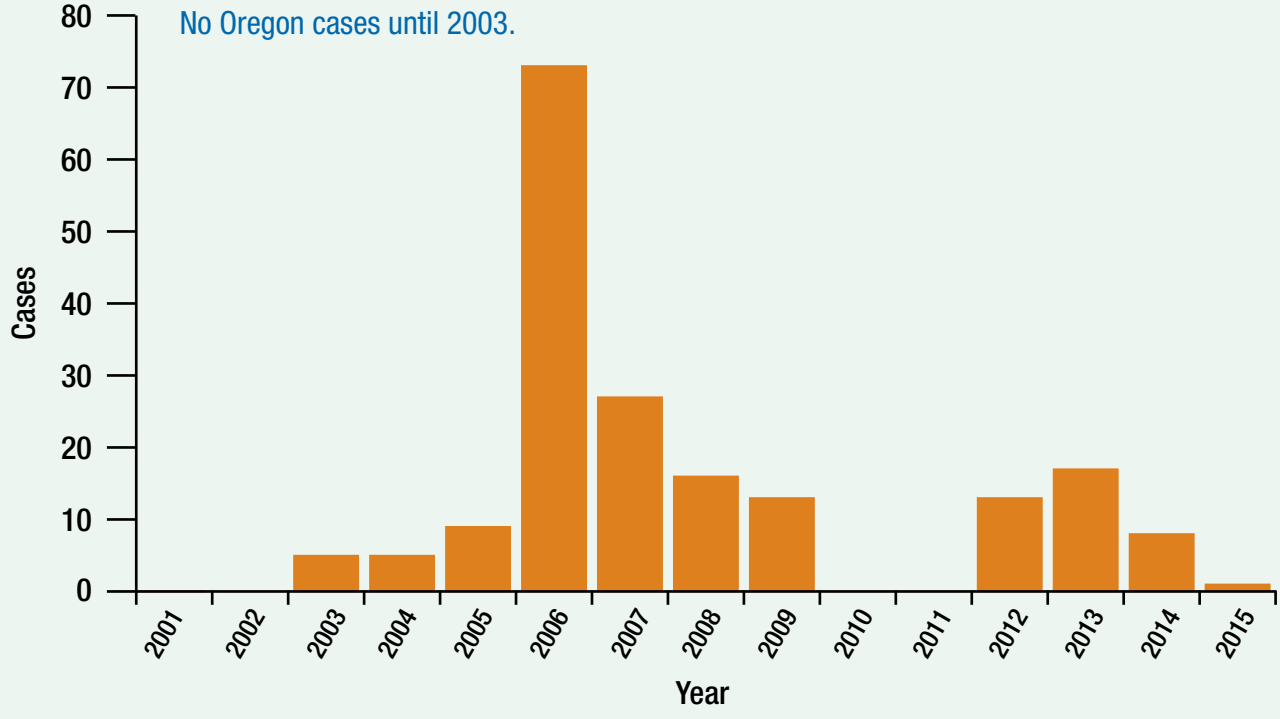
Prevention

- Avoid eating raw oysters or other raw shellfish.
- Cook shellfish (oysters, clams, mussels) thoroughly.

West Nile virus

West Nile virus (WNV) first appeared in the United States on Long Island in 1999 and then moved westward across the country. In Oregon, the first indigenous case was reported in 2004. West Nile virus is a mosquito-borne *Flavivirus* that affects both animals and humans. Corvid birds (crows, ravens, jays, magpies) are the reservoir; humans and other animals are considered "dead-end" hosts — i.e., they may be infected and develop symptoms, but they do not transmit the infection further. Of human beings infected, only about one in five will have any symptoms at all — typically flu-like symptoms such as fever, headache and muscle aches. However, approximately one in 150 infected persons will have symptoms of central nervous system infection that may include neck stiffness, stupor, disorientation, tremors, convulsions, muscle weakness, paralysis and coma. The risk of getting West Nile virus in Oregon has been very low. Though most cases were in those aged 20–50 years, those >50 years of age have the highest risk of developing serious illness. Incidence is highest in the summer months. In 2015, one human cases of West Nile virus was reported. In addition 59 mosquito pools, and 11 birds and six horses tested positive for WNV infection.

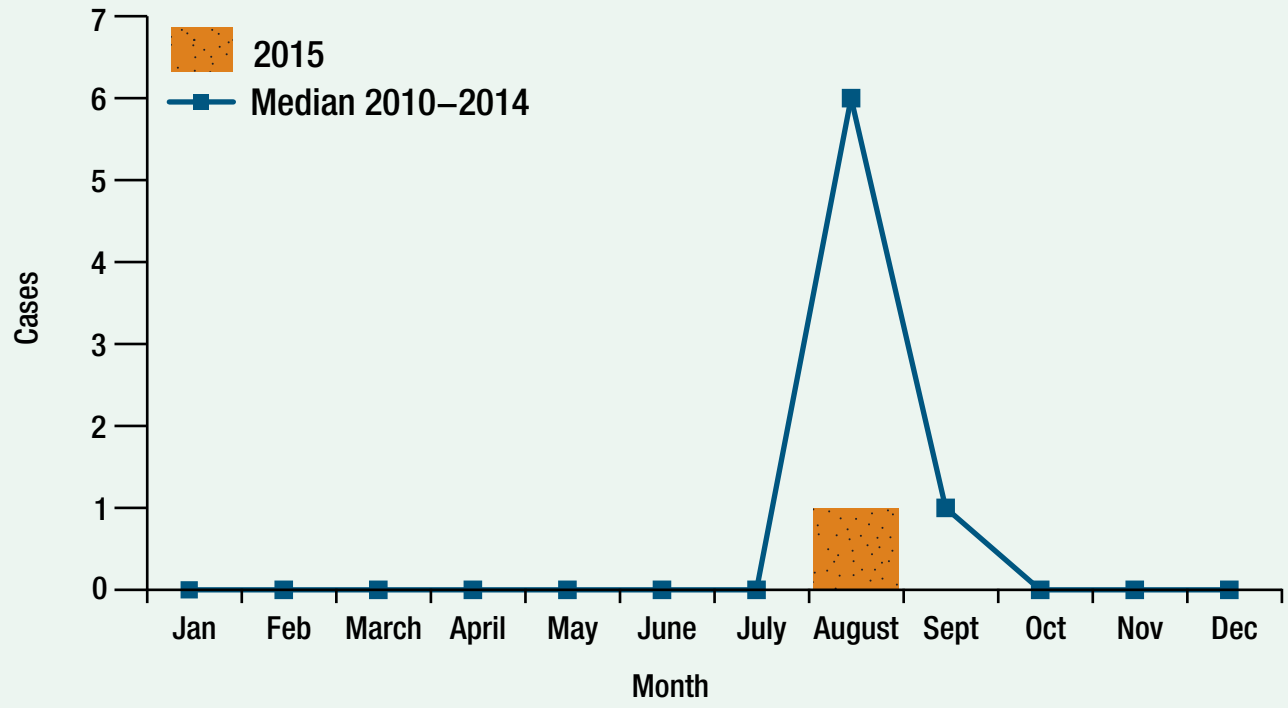
West Nile virus infection by year: Oregon, 2001–2015



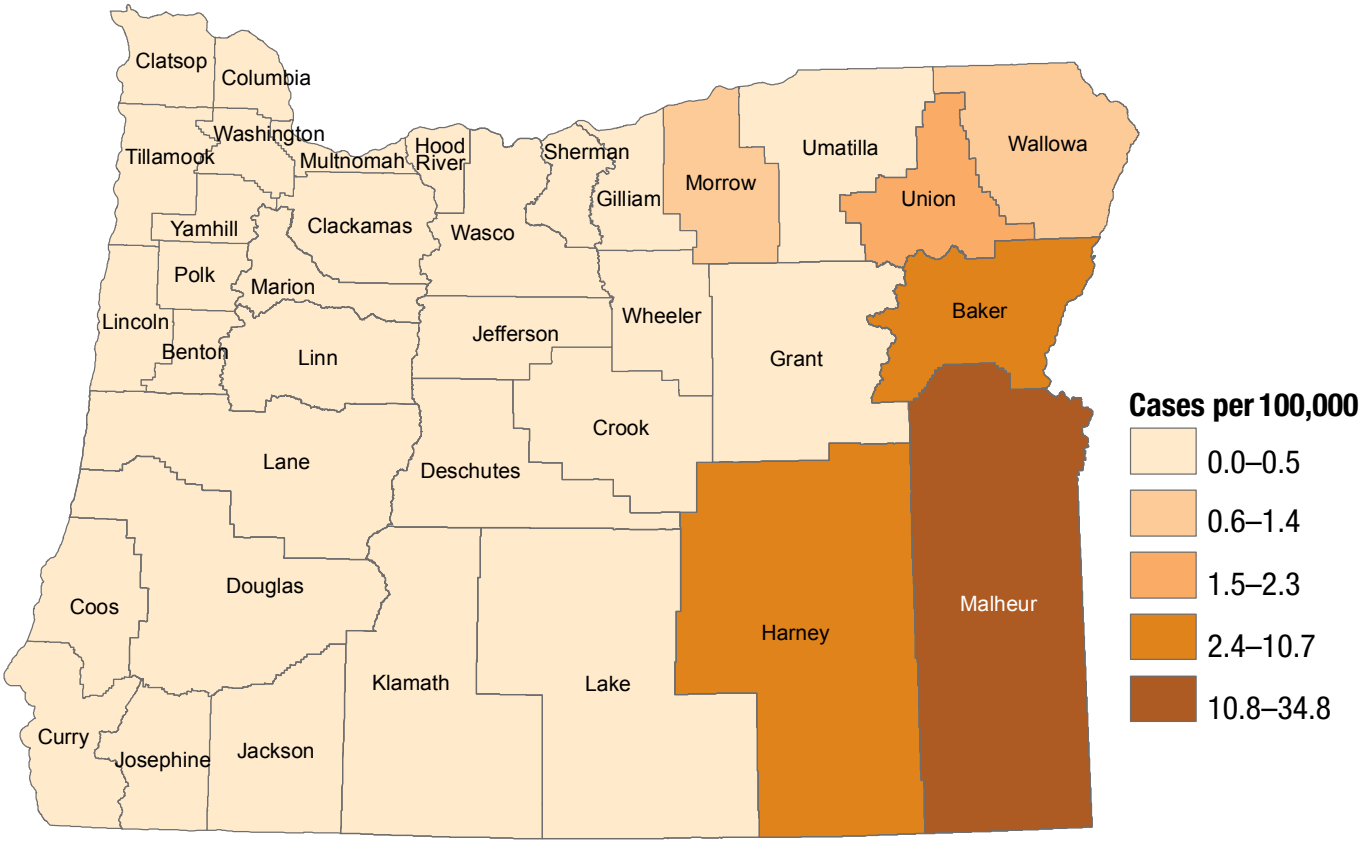
Confirmed WNV infections in Oregon, 2005–2015

Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Human	8	73	27	16	12	0	0	12	16	8	1
Horses	46	35	16	0	5	0	2	2	6	3	6
Birds	15	25	52	2	16	0	0	2	2	7	11
Mosquito pools	11	22	28	16	262	4	3	71	89	58	59
Sentinel chickens	15	0	11	0	0	0	0	0	0	0	0

West Nile virus infection by onset month: Oregon, 2015



Incidence of West Nile virus infection by county of residence: Oregon, 2006–2015



Prevention

- Avoid mosquito bites:
  - › Use insect repellents when you go outdoors. Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-3,8-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions.
  - › When weather permits, wear long sleeves, long pants and socks when outdoors.
  - › Take extra care during peak mosquito-biting hours.
- Mosquito-proof your home:
  - › Install or repair screens on windows and doors to keep mosquitoes outside. Use your air conditioning, if you have it.
  - › Reduce the number of mosquitoes around your home by regularly emptying standing water from flowerpots, gutters, buckets, pool covers, pet water dishes, discarded tires and birdbaths.
- Report dead birds to local authorities.

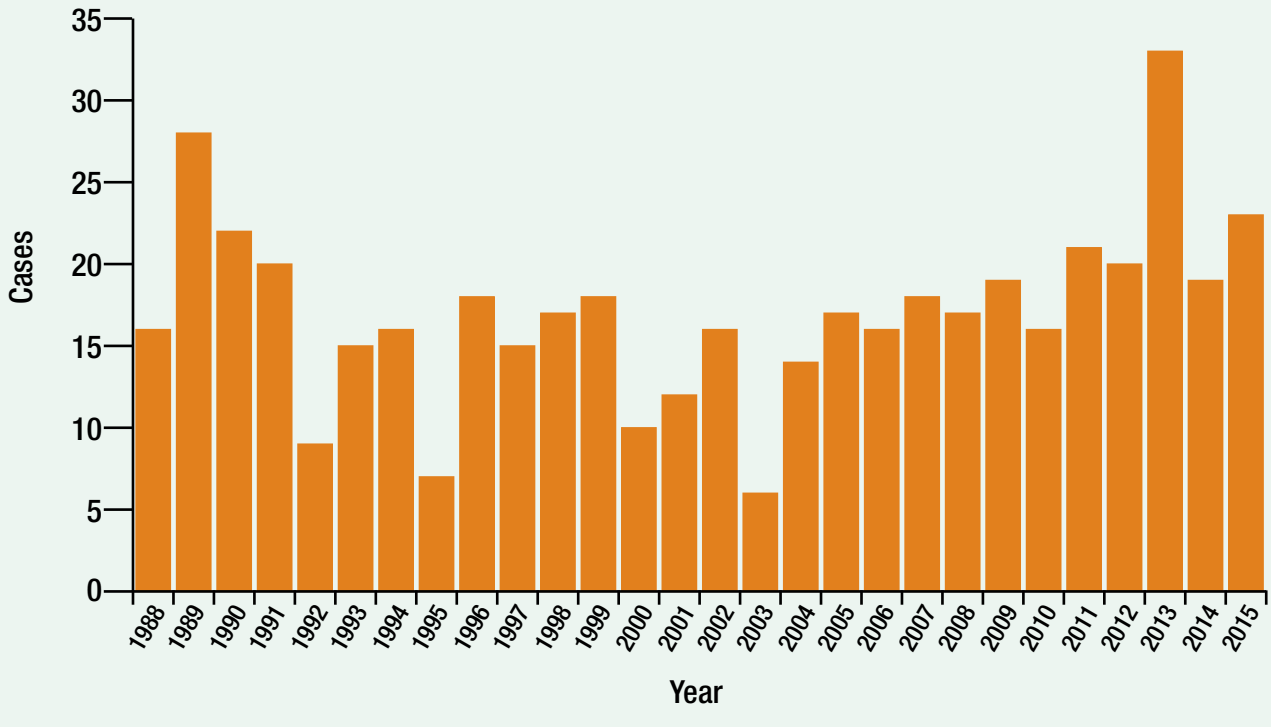
Yersiniosis

Yersiniosis is a bacterial infection characterized by (sometimes bloody) diarrhea, vomiting and abdominal pain. The main reservoir for *Yersinia* is the pig. Transmission occurs by the fecal-oral route through contaminated food and water, or through contact with infected people or animals. Preventive measures include cooking food thoroughly, avoiding cross-contamination with raw food of animal origin and washing hands after handling food.

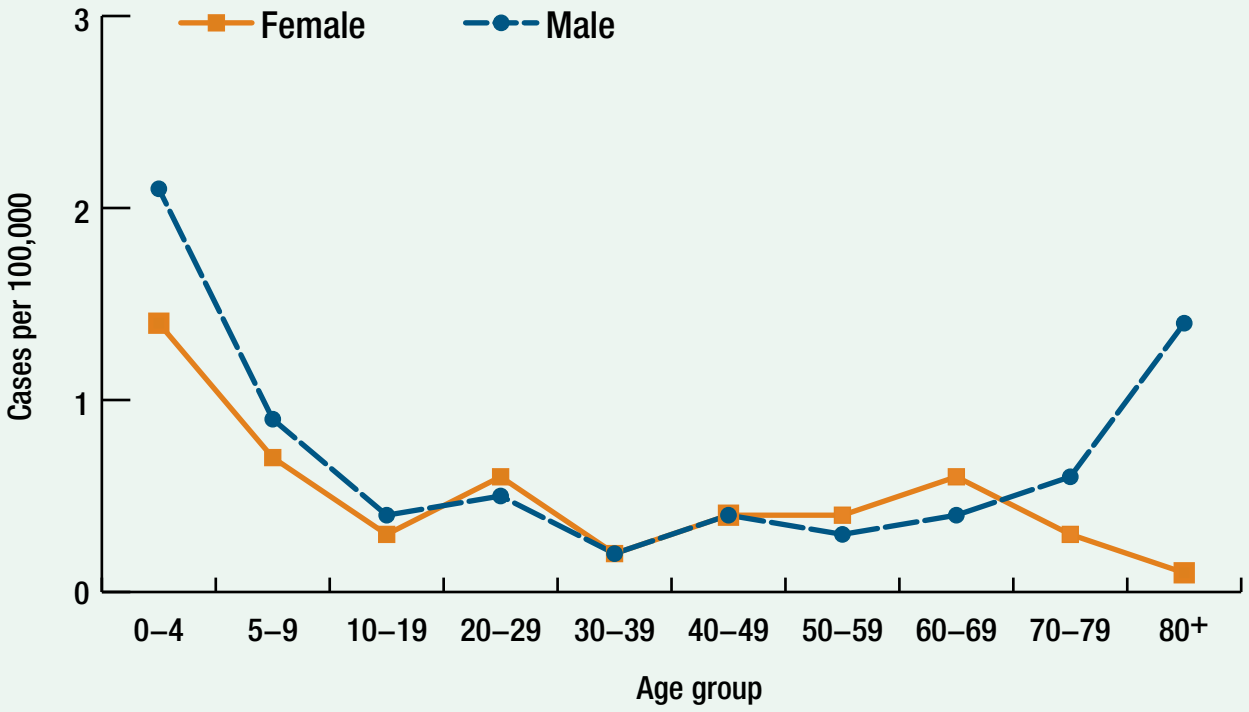
The incidence of yersiniosis in Oregon has been fairly stable over the years. Yersiniosis occurs throughout the year with no seasonality. The most common species is *Y. enterocolitica*. In 2015, there were 23 cases, a 21% increase from 19 cases in 2014. All cases were sporadic except two that were part of a possible restaurant-associated outbreak. The vast majority were *Yersinia enterocolitica* (18). Two were *Y. frederiksenii*, and one each *Y. intermedia* and *Y. kristensenii*.

Infection with *Yersinia pestis*, also known as "plague," is counted separately from other cases of yersiniosis.

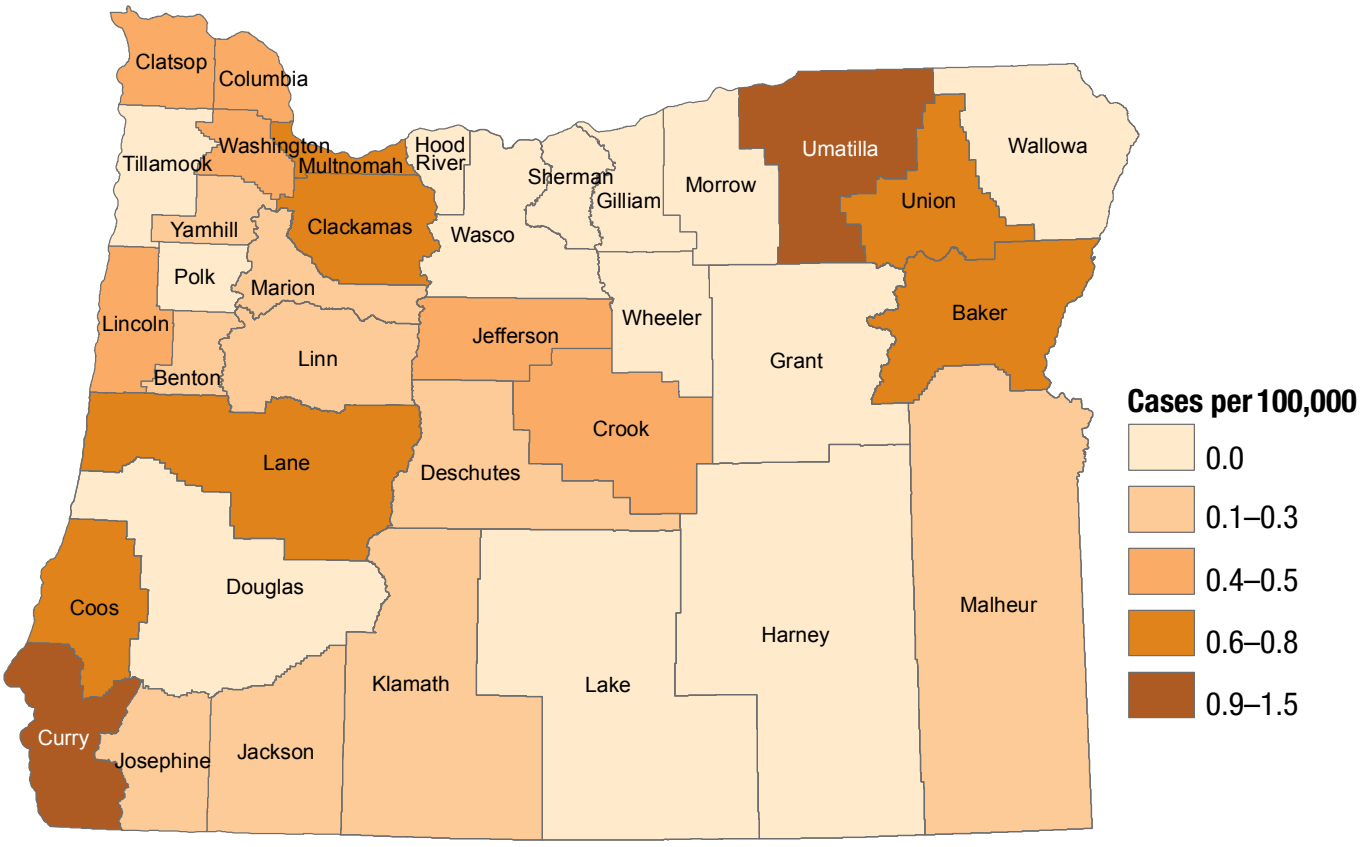
Yersiniosis by year: Oregon, 1988–2015



Yersiniosis by age and sex: Oregon, 2006–2015



Incidence of yersiniosis by county of residence: Oregon, 2006–2015



Prevention

- Avoid eating raw or undercooked pork.
- Consume only pasteurized milk or milk products.
- Wash hands with soap and warm water before eating and preparing food, after contact with animals and after handling raw meat.
- After handling raw chitterlings, clean hands and fingernails scrupulously with soap and water before touching infants or their toys, bottles or pacifiers.
- Prevent cross-contamination in the kitchen; use separate cutting boards for meat and other foods. Carefully clean all cutting boards, countertops and utensils with soap and hot water after preparing raw meat.
- Dispose of animal feces in a sanitary manner.

Disease outbreaks

Oregon state and local health departments investigated 291 acute and communicable disease outbreaks in 2015, up from 256 in 2014 (a 14% increase). Forty-seven percent (138) of these were outbreaks of calicivirus gastroenteritis. Twenty-seven outbreaks were foodborne, 111 were respiratory, three were due to animal contact and one was waterborne. The mode of transmission was undetermined in 54 outbreaks. Sharing of respiratory secretions caused outbreaks of influenza (66) and pertussis (27) and two outbreaks of chickenpox (varicella) can be considered airborne.

Several factors likely led to the unusually high number of influenza-like illness outbreaks in 2015, especially in the long-term care facility (LTCF) setting. The predominant strain of influenza circulating during the 2014–2015 flu season was a drifted variant of influenza A/H3N2. The H3N2 component of the flu vaccine did not match the drifted H3N2 strain that was circulating, which reduced the vaccine's efficacy. In addition, H3N2-predominant seasons historically have been associated with severe illness, particularly among older people. In 2014–2015, 67% of individuals hospitalized with lab-confirmed influenza in the Portland area were ≥65 years.

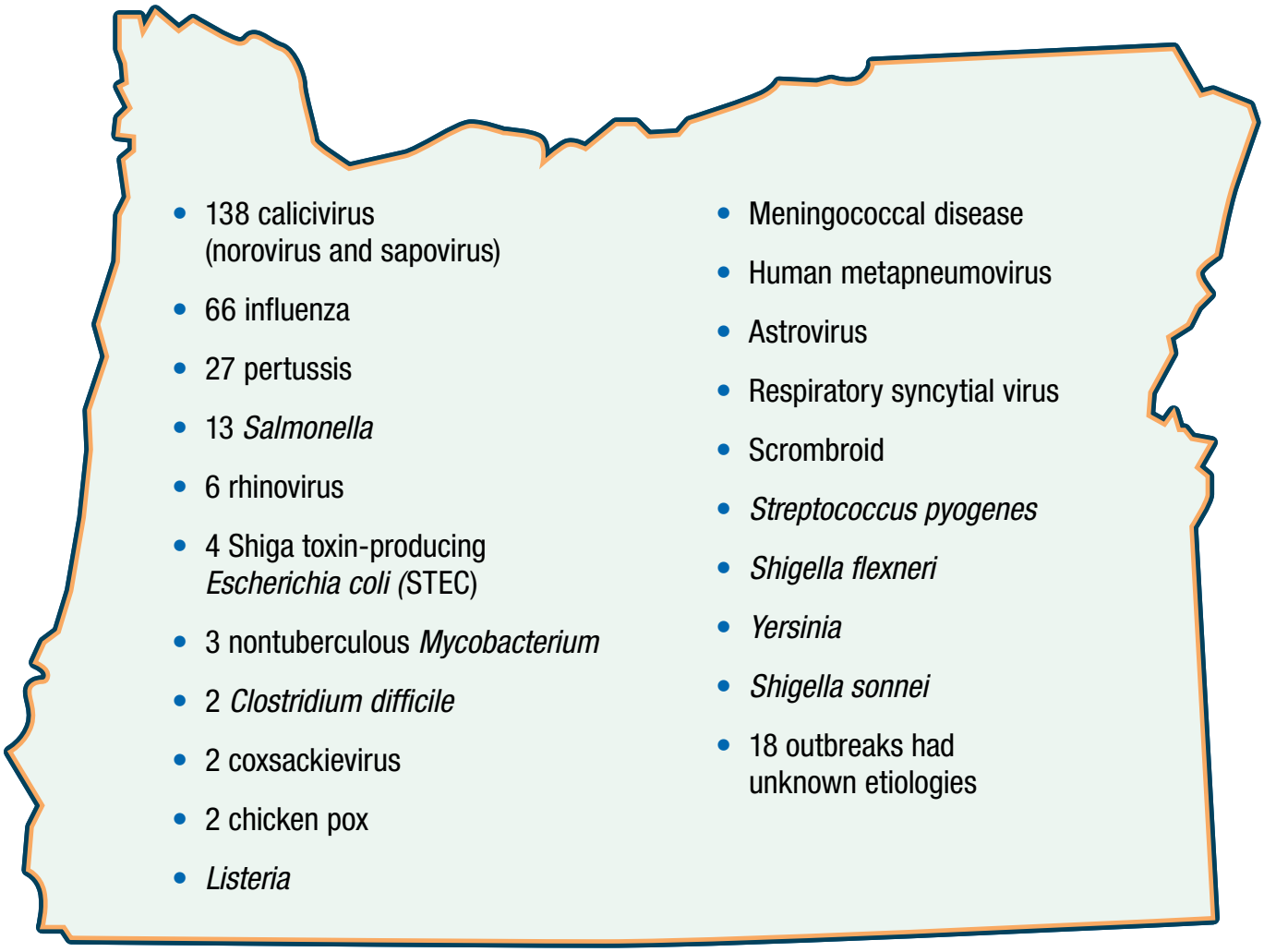
Twenty-one (77%) of the pertussis outbreaks in 2015 were reported in school settings. These cases contributed to the high proportion of cases reported among older teenagers.

Foods contaminated with a variety of *Salmonella* made folks ill at a variety of venues. Almost every outbreak reinforces the tried-and-true public health mantras of "wash your hands" and "cover your cough."

Gastroenteritis is by far the most commonly reported type of outbreak in Oregon, accounting for 172 (59%) of the 291 outbreaks investigated in 2015.

Thanks to rigorous specimen collection by local health investigators, 207 of these outbreaks were confirmed. Fifty-two percent of gastroenteritis outbreaks had disease-causing agents identified, mostly caliciviruses (norovirus and sapovirus). The Oregon State Public Health Laboratory (OSPHL) now routinely tests for sapovirus, astrovirus and rotavirus when stool specimens are norovirus-negative.

Disease outbreaks, by etiology: Oregon, 2015



- 138 calicivirus (norovirus and sapovirus)
- 66 influenza
- 27 pertussis
- 13 *Salmonella*
- 6 rhinovirus
- 4 Shiga toxin-producing *Escherichia coli (*STEC)
- 3 nontuberculous *Mycobacterium*
- 2 *Clostridium difficile*
- 2 coxsackievirus
- 2 chicken pox
- *Listeria*
- Meningococcal disease
- Human metapneumovirus
- Astrovirus
- Respiratory syncytial virus
- Scrombroid
- *Streptococcus pyogenes*
- *Shigella flexneri*
- *Yersinia*
- *Shigella sonnei*
- 18 outbreaks had unknown etiologies

Gastrointestinal outbreaks

Person-to-person transmission was responsible for 75 gastroenteritis outbreaks and foodborne transmission for 26. Transmission was undetermined (we couldn't figure it out) or unknown (we didn't have enough data to figure it out) in 68 of the outbreaks. More than 80% of person-to-person outbreaks happened in institutional cohorts, especially among those in LTCFs.

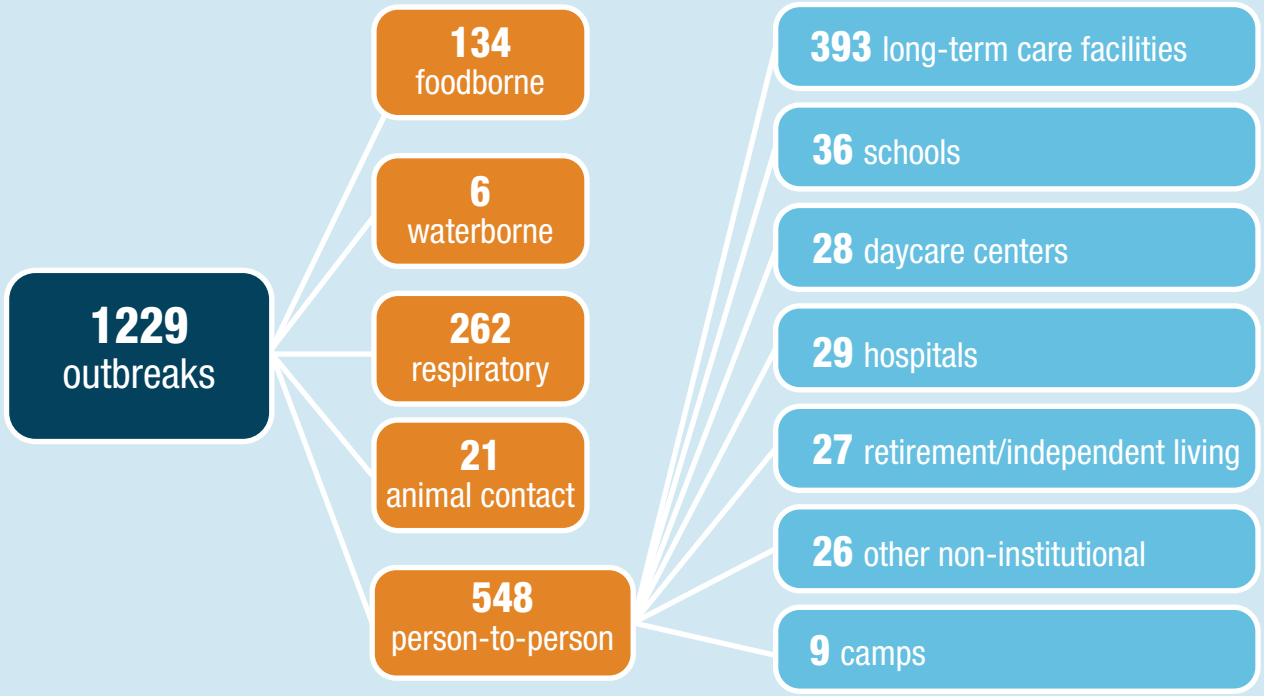
In 2013, the case definition of a norovirus outbreak was modified to be more in line with national standards. Some outbreaks previously classified as indeterminate were reclassified as suspect norovirus. The new classification includes outbreaks where symptoms were classical of norovirus but a positive specimen was not documented.

Fifty-one percent of reported gastroenteritis outbreaks reported from 2011–2015 occurred in LTCFs for the elderly.

Lab-confirmed norovirus and suspect norovirus outbreaks: Oregon, 2011–2015

	2011	2012	2013	2014	2015
Confirmed norovirus	75	121	124	118	95
Suspect norovirus	2	8	14	18	9

Reported outbreaks by transmission mode and settings, Oregon 2011–2015

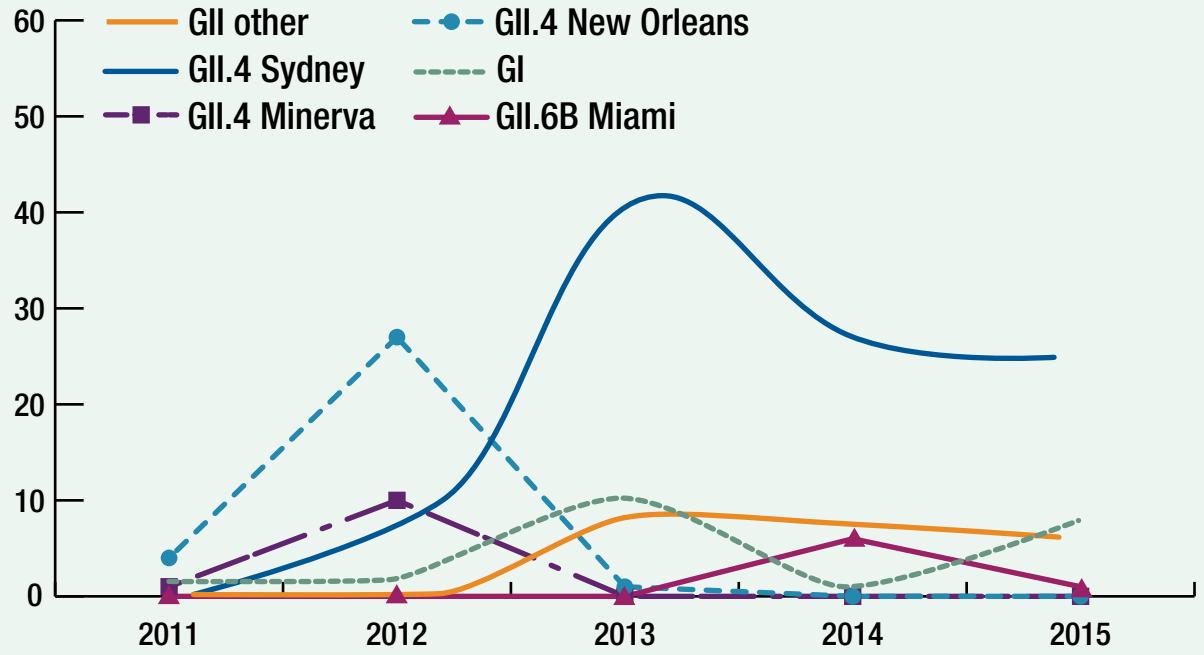


Norovirus outbreaks in long-term care facilities

Norovirus infection causes nausea, vomiting, diarrhea, muscle aches, fever and abdominal cramps, which can result in dehydration. Symptoms typically resolve within a day but can remain for up to three days. Norovirus is highly transmissible and persons typically get norovirus by eating contaminated food containing infected stool or vomit particles.

The Oregon State Public Health Laboratory (OSPHL) began genotyping specimens associated with gastrointestinal outbreaks in late 2012. As shown in the figure, norovirus genogroup GII genotype 4 New Orleans was predominant in 2011 and 2012 accounting for 31 (25%) of 123 total confirmed norovirus outbreaks among Oregon long-term care facilities (LTCF). In late 2012, a new norovirus strain of genogroup GII, genotype 4 originating in Sydney, Australia (GII.4 Sydney 2012), became the predominant norovirus strain and caused a severe norovirus season globally and in the US. In 2013, GII.4 Sydney was responsible for 42 (48%) of 87 confirmed norovirus outbreaks among Oregon LTCF's. GII.4 Sydney has remained the dominant outbreak strain since 2013. In 2015, we saw an increase in other GI genotype outbreaks.

Norovirus sequences in Oregon LTCFs, 2011–2015



(n=193 laboratory confirmed outbreaks)

Norovirus outbreaks in LTCFs by county of occurrence and year of investigation 2006–2015

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Baker	0	0	0	0	0	0	2	1	0	0	3
Benton	1	2	3	1	1	1	0	5	0	1	15
Clackamas	10	11	10	3	14	3	4	4	2	3	64
Clatsop	1	3	1	2	5	1	2	1	1	2	19
Columbia	0	0	1	1	1	0	0	2	1	0	6
Coos	1	2	2	2	2	0	1	2	2	0	14
Crook	0	0	1	1	0	0	0	2	0	0	4
Curry	1	0	0	0	0	0	0	1	0	1	3
Deschutes	6	4	5	5	3	3	10	3	1	7	47
Douglas	3	3	3	0	4	2	1	4	1	1	22
Grant	2	0	1	0	0	0	0	0	1	0	4
Harney	0	1	0	0	0	0	0	0	0	0	1
Hood River	1	1	1	2	1	1	2	2	2	1	14
Jackson	4	7	4	6	3	2	3	2	5	3	39
Jefferson	1	0	0	0	0	0	0	0	0	0	1
Josephine	5	2	2	0	0	0	0	1	0	0	10
Klamath	1	2	2	0	2	4	1	1	1	1	15
Lake	0	0	0	0	0	0	0	0	0	0	0
Lane	8	10	6	8	10	3	8	6	14	6	79
Lincoln	0	0	1	0	1	1	0	1	1	0	5
Linn	4	1	7	0	4	3	3	3	8	3	36
Malheur	0	0	1	0	0	0	0	0	0	0	1
Marion	13	12	12	5	9	4	10	8	12	3	88
Morrow	0	1	0	0	0	0	0	0	0	0	1
Multnomah	5	12	11	11	8	12	15	22	16	10	122
Polk	3	2	3	2	2	1	1	2	1	1	18
Tillamook	0	0	1	1	1	1	0	0	0	0	4
Umatilla	1	2	1	0	2	3	2	1	2	2	16
Union	0	1	1	0	0	1	0	0	2	0	5
Wasco	3	0	1	2	2	1	1	2	3	2	17
Washington	11	8	7	8	8	3	12	8	5	7	77
Yamhill	5	6	6	1	6	4	4	4	4	6	46
Total	**90**	**93**	**94**	**61**	**89**	**54**	**82**	**88**	**85**	**60**	**796**

Data as of 09/26/2016

Selected cases of notifiable diseases by year,* Oregon 1994–2004

Disease	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Campylobacteriosis	655	626	705	742	700	599	568	599	575	597	661
Cryptosporidiosis	19	42	37	34	128	35	23	60	41	37	32
***E. coli* O157 (STEC)**	111	94	105	92	107	68	136	97	209	105	70
Giardiasis	935	900	899	880	898	795	673	536	432	407	445
H. influenzae	22	27	32	35	39	51	30	39	57	42	49
Hepatitis A	1364	2927	884	390	426	249	165	109	61	62	67
Acute hepatitis B	225	182	164	133	163	124	125	167	128	118	119
Acute hepatitis C	1	7	22	10	7	27	19	15	13	15	15
Legionellosis	0	0	0	0	1	1	1	4	9	17	8
Listeriosis	7	13	15	11	18	17	6	12	9	5	7
Lyme	7	22	18	21	23	13	14	16	15	18	28
Malaria	16	23	23	26	16	22	41	15	14	10	19
Measles	2	1	14	0	3	9	0	3	0	3	0
Meningococcal disease	136	118	115	109	75	75	71	64	44	60	61
Pertussis	61	57	61	49	83	60	103	66	192	439	614
Rabies, animal	13	4	6	12	5	4	7	4	14	7	6
Salmonellosis	332	342	377	382	343	417	296	280	335	424	414
Shigellosis	166	174	152	196	188	102	159	115	106	211	87
Vibriosis	0	1	0	7	7	3	7	6	16	6	12
West Nile virus	0	0	0	0	0	0	0	0	0	5	5
Yersiniosis	16	7	18	15	17	18	10	12	16	6	14

*Data as of 9/22/2016

Selected cases of notifiable diseases by year,* Oregon 2005–2015

Disease	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Campylobacteriosis	651	652	729	701	732	862	984	913	853	917	889
Cryptosporidiosis	69	85	165	65	224	220	219	219	277	115	215
***E. coli* O157 (STEC)**	158	107	85	68	84	119	136	193	189	184	230
Giardiasis	418	426	463	451	430	486	444	387	362	355	334
H. influenzae	52	55	68	55	57	69	75	67	84	83	97
Hepatitis A	47	46	35	27	19	17	12	9	28	14	27
Acute hepatitis B	105	80	61	47	50	45	33	28	34	34	26
Acute hepatitis C	20	27	22	32	24	22	23	38	14	14	13
Legionellosis	15	22	14	18	19	18	24	32	27	41	50
Listeriosis	11	13	8	6	19	17	10	15	7	16	16
Lyme	27	28	34	48	44	44	41	51	45	43	35
Malaria	13	15	17	4	12	16	23	12	14	19	20
Measles	2	2	2	1	0	0	3	1	6	5	1
Meningococcal disease	57	41	32	38	41	32	31	26	12	18	29
Pertussis	622	112	131	174	255	285	330	910	486	406	593
Rabies, animal	8	25	12	13	11	17	17	17	10	13	20
Salmonellosis	414	424	332	429	440	511	367	399	375	397	528
Shigellosis	127	121	87	94	56	58	57	92	55	50	112
Vibriosis	9	19	8	12	19	25	7	19	27	29	26
West Nile virus	9	73	27	16	13	0	0	13	17	8	1
Yersiniosis	17	16	18	17	19	16	21	20	33	19	23

*Data as of 9/22/2016

Selected low incidence disease case counts by year, Oregon 2006-2015

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Babesiosis	0	0	0	1	0	1	0	0	1	4
Botulism	0	1	2	0	1	3	6	4	1	3
Brucellosis	0	2	1	3	1	1	0	2	1	0
Chikungunya	0	0	0	0	0	0	0	0	7	4
Cyclosporiasis	2	0	0	0	0	0	1	0	1	0
Dengue Fever	2	4	6	4	8	2	4	4	6	5
Ehrlichiosis	1	1	1	3	0	6	0	1	0	1
Hantavirus pulmonary	1	1	0	2	3	2	2	1	1	0
Leishmaniasis	0	0	0	0	0	0	0	1	0	0
Leprosy	0	1	1	2	0	0	0	0	0	0
Leptospirosis	1	0	1	0	0	1	0	0	2	0
Measles	2	2	1	0	0	3	1	6	5	2
Plague	0	0	0	0	2	1	2	0	0	2
Q fever	0	2	1	4	3	1	4	3	9	2
Relapsing Fever	2	0	4	3	0	0	3	1	4	3
Rocky Mtn Spotted fev	2	2	3	0	1	0	1	2	2	5
Rubella	0	0	0	0	0	0	0	1	0	0
Scrombroid	0	0	0	0	0	0	0	1	0	4
Taeniasis	3	3	11	50	3	5	5	2	3	3
Tularemia	3	3	4	1	3	5	0	3	4	6
Zika	0	0	0	0	0	0	0	0	3	2

*Data as of 2/22/2017

Selected Oregon communicable disease case counts by county of residence, 2015

County	Campylobacteriosis	Carbapenem-resistant Enterobacteriaceae	Cryptococcosis	Cryptosporidiosis	*E. coli* O157 and (STEC) infection	Giardiasis	*Haemophilus influenzae*	Hepatitis A	Hepatitis B (acute)	Hepatitis B (chronic)*	Hepatitis C (acute)	Hepatitis C (chronic)*
Baker	1	1	0	1	2	0	0	0	0	1	0	34
Benton	20	3	1	11	6	4	1	1	1	10	0	52
Clackamas	99	14	6	20	23	33	11	6	2	46	2	476
Clatsop	4	1	0	1	0	5	0	0	0	4	0	74
Columbia	5	1	1	1	6	1	0	1	2	4	0	75
Coos	9	0	1	3	2	1	1	0	0	9	0	107
Crook	5	2	0	0	8	1	0	0	2	1	0	24
Curry	2	1	0	0	0	0	0	1	0	0	1	37
Deschutes	44	9	11	3	23	19	2	1	1	6	0	179
Douglas	12	2	0	9	3	6	2	1	1	3	1	229
Gilliam	1	0	0	0	0	0	0	0	0	0	0	2
Grant	2	0	0	0	1	0	0	0	0	0	0	3
Harney	1	0	0	1	1	0	0	0	0	2	1	8
Hood River	4	1	0	0	0	5	0	1	0	2	0	8
Jackson	48	10	2	14	20	5	6	0	2	10	0	419
Jefferson	8	1	0	0	3	5	0	1	0	1	0	50
Josephine	11	5	1	3	1	3	8	0	0	3	0	168
Klamath	12	1	0	0	9	1	2	1	0	2	0	97
Lake	2	0	0	0	3	2	1	0	0	0	0	20
Lane	73	5	11	22	13	19	11	1	1	37	4	590
Lincoln	4	0	2	2	0	2	0	0	1	2	0	115
Linn	35	6	1	7	9	11	5	0	2	4	0	183
Malheur	16	0	0	0	4	3	0	0	0	1	1	64
Marion	64	8	9	11	25	14	8	2	0	19	2	471
Morrow	1	0	0	3	0	0	0	0	0	0	0	13
Multnomah	222	16	11	53	17	138	23	2	8	209	0	1511
Polk	14	1	2	2	5	6	1	1	0	8	0	76
Sherman	0	1	0	0	0	0	0	0	0	0	0	1
Tillamook	7	0	1	8	3	6	0	0	0	1	0	40
Umatilla	11	2	0	0	4	6	3	0	0	2	0	113
Union	5	0	0	0	4	1	0	0	0	1	0	14
Wallowa	2	0	0	0	1	0	0	0	0	1	0	3
Wasco	4	2	0	0	0	1	1	0	0	0	0	31
Washington	122	6	10	35	27	33	7	7	3	110	1	563
Wheeler	1	0	0	0	0	0	0	0	0	0	0	3
Yamhill	18	2	5	5	7	3	4	0	0	4	0	104
Total	**889**	**101**	**75**	**215**	**230**	**334**	**97**	**27**	**26**	**503**	**13**	**5,957**

Orpheus data as of 9/22/2016

Case counts by onset date except * uses report date

Selected Oregon communicable disease case counts by county of residence, 2015

County	Legionellosis	Listeriosis	Lyme disease	Meningococcal disease	Nontuberculous *Mycobacterium*	Pertussis	Rabies, animal	Salmonellosis	Shigellosis	Vibriosis	West Nile virus	Total
Baker	0	0	0	0	1	0	0	6	0	0	0	**47**
Benton	0	0	0	0	0	34	3	12	0	1	0	**160**
Clackamas	8	2	9	2	2	53	1	53	8	1	0	**877**
Clatsop	0	0	0	0	0	4	0	8	0	0	0	**101**
Columbia	0	0	0	1	0	1	0	10	2	0	0	**111**
Coos	0	0	0	1	0	5	0	8	0	1	0	**148**
Crook	0	0	0	0	0	2	0	3	0	0	0	**48**
Curry	0	0	0	1	0	0	1	0	0	0	0	**44**
Deschutes	2	0	1	1	1	40	1	26	1	1	0	**372**
Douglas	1	1	3	3	0	2	0	16	0	0	0	**295**
Gilliam	0	0	0	0	0	0	0	0	0	0	0	**3**
Grant	0	0	0	0	0	5	0	0	0	0	0	**11**
Harney	0	0	0	0	1	0	0	0	0	0	0	**15**
Hood River	0	0	0	0	0	2	0	0	0	0	0	**23**
Jackson	2	2	3	2	6	32	3	16	0	0	0	**602**
Jefferson	0	0	0	0	0	2	0	1	1	0	0	**73**
Josephine	0	0	1	1	1	2	1	5	0	1	1	**216**
Klamath	1	0	3	0	2	4	0	2	0	0	0	**137**
Lake	0	0	0	0	0	6	0	3	0	0	0	**37**
Lane	7	2	2	7	6	65	5	46	0	4	0	**931**
Lincoln	3	0	0	0	1	6	0	3	1	1	0	**143**
Linn	2	0	0	0	1	4	0	13	2	0	0	**285**
Malheur	0	0	0	0	0	1	0	6	0	0	0	**96**
Marion	1	2	1	1	1	62	2	52	3	1	0	**759**
Morrow	0	0	0	0	0	0	0	4	0	0	0	**21**
Multnomah	14	4	6	3	7	72	0	111	69	6	0	**2502**
Polk	1	0	0	1	0	13	0	13	0	1	0	**145**
Sherman	0	0	0	0	0	0	0	0	0	0	0	**2**
Tillamook	1	0	0	0	0	0	0	2	0	2	0	**71**
Umatilla	0	0	1	0	1	7	0	12	1	1	0	**164**
Union	0	0	0	0	0	9	0	10	0	0	0	**44**
Wallowa	0	0	0	0	0	0	0	1	0	0	0	**8**
Wasco	0	0	1	0	0	18	1	1	0	0	0	**60**
Washington	7	3	3	4	7	104	2	66	20	5	0	**1145**
Wheeler	0	0	0	0	0	0	0	0	0	0	0	**4**
Yamhill	0	0	1	1	2	38	0	19	4	0	0	**217**
Total	**50**	**16**	**35**	**29**	**40**	**593**	**20**	**528**	**112**	**26**	**1**	

Orpheus data as of 9/22/2016

Infections, diseases and conditions reportable by clinicians: 2015

Report immediately

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum*)
- Cholera (*Vibrio cholerae* O1, O139, or toxigenic)
- Diphtheria (*Corynebacterium diphtheriae*)
- Hemorrhagic fever caused by viruses of the filovirus (e.g., Ebola, Marburg) or arenavirus (e.g., Lassa, Machupo) families
- Influenza (novel)[1] (From footnote: Influenza A virus that cannot be subtyped by commercially distributed assays)
- Marine intoxication (intoxication caused by marine microorganisms or their byproducts (e.g., paralytic shellfish poisoning, domoic acid intoxication, ciguatera, scombroid)
- Measles (rubeola)
- Plague (*Yersinia pestis*)
- Poliomyelitis
- Rabies (human)
- Rubella
- SARS (Severe Acute Respiratory Syndrome or SARS-coronavirus)
- Smallpox (variola)
- Tularemia (*Francisella tularensis*)
- Yellow fever
- Outbreaks and uncommon illnesses (any known or suspected common-source outbreak; any uncommon illness of potential public health significance)

Report within 24 hours (including weekends and holidays)

- *Haemophilus influenzae* (any isolation or identification from a normally sterile specimen type)
- *Neisseria meningitidis*
- Pesticide poisoning

Report within one working day

- Amebic infections (central nervous system only) (for example infection by *Naegleria* or *Balamuthia* spp.
- Animal bites (of humans)
- Arthropod vector-borne disease (babesiosis, California encephalitis, Colorado tick fever, dengue, Eastern equine encephalitis, ehrlichiosis, Kyasanur Forest disease, St. Louis encephalitis, West Nile fever, Western equine encephalitis, etc.)
- Brucellosis (*Brucella*)
- Campylobacteriosis (*Campylobacter*)
- Chancroid (*Haemophilus ducreyi*)
- Chlamydiosis (*Chlamydia trachomatis*; lymphogranuloma venereum)
- Coccidioidomycosis (*Coccidioides*)
- Creutzfeldt-Jakob disease (CJD) and other transmissible spongiform encephalopathies
- Cryptococcosis (*Cryptococcus)*
- Cryptosporidiosis (*Cryptosporidium*)
- Cyclosporosis (*Cyclospora cayetanensis*)
- *Enterobacteriaceae* family isolates found to be non-susceptible to any carbapenem antibiotics by current CLSI breakpoints.
- *Escherichia coli* (Shiga-toxigenic, including *E. coli* O157 and other serogroups)
- Giardiasis (*Giardia*)
- Gonococcal infections (*Neisseria gonorrhoeae*)
- *Grimontia* spp. infection (formerly *Vibrio hollisae*)
- Hantavirus
- Hemolytic uremic syndrome (HUS)
- Hepatitis A
- Hepatitis B (acute or chronic infection)
- Hepatitis C (acute or chronic infection)
- Hepatitis D (delta)
- Hepatitis E
- HIV infection (does not apply to anonymous testing) and AIDS

- Influenza (laboratory-confirmed) death of a person <18 years of age
- Lead poisoning (from footnote) Lead poisoning means a confirmed blood level of at least 5 ug/dL for children<18 years of age, or a confirmed blood level of at least 10 ug/dL for person <18 years of age
- Legionellosis (*Legionella*)
- Leptospirosis (*Leptospira*)
- Listeriosis (*Listeria* monocytogenes)
- Lyme disease (*Borrelia burgdorferi*)
- Malaria (*Plasmodium*)
- Mumps
- Non-tuberculosis mycobacterial infection (non-respiratory) (from footnote Infection at any site with *M. tuberculosis* or *M. bovis* is reportable. Only non-respiratory infections with other mycobacteria are reportable.)
- Pelvic inflammatory disease (PID, acute, non-gonococcal)
- Pertussis (*Bordetella pertussis*)
- Psittacosis (*Chlamydophila psittaci*)
- Q fever (*Coxiella burnetii*)
- Relapsing fever (*Borrelia)*
- Rickettsia (all species: Rocky Mountain spotted fever, typhus, others)
- Salmonellosis (*Salmonella*, including typhoid)
- Shigellosis (*Shigella*)
- Syphilis (*Treponema pallidum*)
- *Taenia* infection (including cysticercosis and tapeworm infections)
- Tetanus (*Clostridium tetani*)
- Trichinosis (*Trichinella*)
- Tuberculosis (*Mycobacterium tuberculosis* and *M. bovis*) (from footnote Infection at any site with *M. tuberculosis* or *M. bovis* is reportable. Only non-respiratory infections with other mycobacteria are reportable.)
- Vibriosis (other than cholera)
- Yersiniosis (other than plague)

Posters available at www.healthoregon.org/diseasereporting

Diseases, infections, microorganisms and conditions reportable by laboratories: 2015

Bacteria

- *Anaplasma*
- *Bacillus anthracis*
- *Bordetella pertussis*
- *Borrelia*
- *Brucella*
- *Campylobacter*
- *Chlamydia trachomatis*
- *Chlamydophila psittaci*
- *Clostridium botulinum*
- *Clostridium tetani*
- *Corynebacterium diphtheriae*
- *Coxiella burnetii*
- *Ehrlichia*
- *Enterobacteriaceae* family isolates found to be non-susceptible to any carbapenem antibiotic by current CLSI breakpoints
- *Escherichia coli* (Shiga-toxigenic)
- *Francisella tularensis*
- *Grimontia hollisae* (formerly *Vibrio hollisae)*
- *Haemophilus ducreyi*
- *Haemophilus influenzae*
- *Legionella*
- *Leptospira*
- *Listeria* monocytogenes
- *Mycobacterium bovis*
- *Mycobacterium tuberculosis*
- *Mycobacterium*, other (non-respiratory only)
- *Neisseria gonorrhoeae*
- *Neisseria meningitidis*
- *Rickettsia*
- *Salmonella*
- *Shigella*
- *Treponema pallidum*
- *Vibrio cholerae*
- *Vibrio, non-cholerae*
- *Yersinia, pestis*
- *Yersinia*, non-pestis

Fungi

- *Coccidioides* (new)
- *Cryptococcus*

Parasites

- Amebic infections (central nervous system only) NEW
- *Babesia*
- *Cryptosporidium*
- *Cyclospora*
- *Giardia*

Prion diseases

- Creutzfeldt-Jakob disease (CJD), other prion diseases

Viruses

- Arboviruses
- Arenaviruses
- Filoviruses
- Hantavirus
- Hepatitis A
- Hepatitis B
- Hepatitis C
- Hepatitis D (delta)
- Hepatitis E
- Hemorrhagic fever viruses
- HIV infection and AIDS
- Influenza, novel strain
- Measles (rubeola)
- Mumps
- Polio
- Rabies
- Rubella
- SARS-coronavirus
- Variola major (smallpox)
- West Nile
- Yellow fever

Other important reportables

- Any "uncommon illness of potential public health significance"
- Any outbreak of disease
- Any other arthropod-borne viruses (California encephalitis, Colorado tick fever, Dengue, Eastern equine encephalitis, Kyasanur Forest, St. Louis encephalitis)
- Results on all blood testing should be reported within seven days unless they indicate lead poisoning, which must be reported within one local health department working day
- All CD4 counts and HIV viral loads

Oregon Health Authority

PUBLIC HEALTH DIVISION

You can get this document in other languages, large print, braille or a format you prefer. Contact the Acute and Communicable Disease Prevention Section at 971-673-1111. We accept all relay calls or you can dial 711.

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